Federal Communications Commission
Rural Health Care Pilot Program
Application

FCC Docket No: 02-60

The Oregon Health Network
May 7, 2007

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Submitted by: Oregon Association of Hospital and Health Systems Research and Education Foundation (OREF)

May 2, 2007

The Honorable Kevin Martin, Chairman
Federal Communications Commission
445 12th Street, SW
Washington, DC

RE: WC Docket No. 02-60
     Rural Health Care Pilot Program Application
     Oregon Health Network
     State of Oregon

Dear Chairman Martin:

On behalf of the **Oregon Health Network (OHN),** I am submitting this application for funding consideration under the FCC Pilot Program – WC Docket No. 02-60. The OHN team is committed to this proposal that will bring access to rural citizens in Oregon. It will be our pleasure to work with a Federal agency that has the same commitment to improve the quality of life for our rural citizens and communities.

The OHN proposal and request fo**r $20,182,625** has the potential to serve Oregon's **3.6 million citizens** and **four hundred eighty-two (482) towns and communities** throughout the state of Oregon. **Three hundred ninety-six (396)** of these towns and communities are considered rural or underserved.

The vision of this network is shared by the **Oregon Association of Hospitals and Health Systems (OAHHS)** and the **Telehealth Alliance of Oregon (TAO)**. The OAHHS is comprised of 57 member hospitals and healthcare systems including a strong component that represents the small and rural hospitals in Oregon. The OAHHS collectively serves more than one million Oregonians. The TAO is volunteer organization. Its members represent countless years of telehealth expertise and leadership. Together OAHHS and TAO have drawn together more than 150 organizations and individuals who share in the mission of this first critical step toward building a national healthcare highway – the *Oregon Health Network.* Collectively, this leadership group will speak to the challenges of a rural, significantly underserved Oregon population, and respond with both an infrastructure and vision toward an improved health and well being for all Oregonians.

The visionary proposal of **Oregon Health Network** will create a digital broadband network of networks that would securely and privately interconnect all Oregon hospitals and clinics, for the provision of telehealth services. In addition, the network would connect to the state and county public health offices and educational institutions that provide training for health care professionals.

The network would interconnect with both the Internet and Internet2 to reach relevant sites on those networks. The proposal includes inter-operability with public safety networks to coordinate disaster planning and response. Other connections will include health insurers, pharmacies, along with secure access via the Internet for authorized users such as clinician's on-call and home health monitoring.

The Oregon Health Network has four primary goals that will guide the development of their network:

- The State of Oregon will achieve significant advances toward parity in its health related services across its urban, suburban and rural regions through the deployment of the OHN as an independent member organization;

- The proliferation of successful telehealth applications across Oregon's most underserved areas will be attained through the active involvement of rural stakeholders, and a comprehensive program of education and technical support of rural network users;

- The active and ongoing participation of rural providers in telehealth applications will be sustained by a sliding scale fee system; and

- OHN will establish a statewide broadband network and network applications that improve access to and quality of care in Oregon, as well as participate in development of a national health network that more fully serves the healthcare needs of all U.S. citizens.

The vision for the OHN is easy to state, but difficult and costly to implement in a rural state like Oregon where more than 50.3% of the land mass is federally owned, operated, and not an active element of the state's economic viability. Funding from the FCC Rural Health Care Pilot Program will assist in reducing the cost component of this equation. The wisdom, commitment and aspirations of a multidisciplinary Oregon leadership group will address the infrastructure and geography components.

In closing, I want to commend you for establishing this pilot program and opening the door for the FCC Commission to re-examine the rural health care (RHC) universal service support program. In particular, I am pleased that the FCC Commission has significantly expanded the scope of the RHC under this pilot to encourage infrastructure investment and the deployment of dedicated networks.

If you have any questions or need any clarification, please feel free to contact us. Thank you in advance for considering our proposal. We look forward to hearing from you.

Sincerely,

Andrew Davidson
President/CEO

TABLE OF CONTENTS

I.   EXECUTIVE SUMMARY / PROJECT ABSTRACT

The **Oregon Health Network (OHN)** is an idea whose time is well at hand. This plan, which creates a seamless regional telehealth network throughout the state of Oregon, marks the transition point where the potential of telecommunications for healthcare delivery and healthcare education can be realized. The initial healthcare benefits to be realized in this transition are only the tip of a social and economic iceberg of potential returns that can accrue from this visionary application of local talent, statewide collaboration and strategically focused federal investment.

Upon full realization, the OHN will interconnect all Oregon hospitals, clinics, county public health offices, physicians, mental health, dental and optical clinics, and health education institutions with a level

of interactive service delivery and access to resources only imagined in rural and underserved communities. The OHN is designed to be inter-operable with Oregon Public Safety and Emergency Management networks and Oregon government and education networks. It will also interconnect with both Internet and Internet 2/National Lambda Rail, assuring access to all sites on these networks, a critical first step toward a national healthcare highway.

By leveraging FCC funds, the OHN will enable the deployment of an expanded telehealth network, bringing improved access and quality of care throughout Oregon. This project continues a long tradition of federal infrastructure investments from the initial railroads across the west through the Interstate Highway system to the current expansion of electronic communications. Once the basic infrastructure is in place, its creative usage can and will expand exponentially in all directions.

This shared vision is a remarkable coalescence of organizations that have converged to create the OHN. With **more than 150 organizations and individuals** cooperating and collaborating in this effort, the unique culture of Oregon is both well represented and well served by this emerging OHN project that it has brought to life. Drawing from a wealth of technical telecommunications experience as well as health, education and community organizing expertise, a wide range of proven practices and practical know-how has come together to serve the public interest.

The two primary organizations providing leadership in the two-year FCC pilot phase of the project are the **Oregon Association of Hospitals and Health Systems (OAHHS)** and the **Telehealth Alliance of Oregon (TAO).** OAHHS is comprised of 57 member hospitals and healthcare systems that operate in Oregon with a Board of Trustees drawn from this membership. An important member component of OAHHS represents Oregon's small and rural hospitals that collectively serve more than one million Oregonians throughout the state. The OAHHS Foundation is the applicant, and will serve as the administrative and fiduciary agent for the for this FCC project. The OAHHS will draw upon the expertise of TAO, a volunteer organization providing telehealth leadership in obtaining reimbursement for telemedicine services in Oregon and fostering legislative support for telehealth facilities to more visionary projects such as OHN. The intention of these two parenting organizations is to create, by the conclusion of the initial two year project, the creation of a self-governing OHN that will chart its own course as an independent charitable non-profit organization, fully able to advance and support the continued expansion

of Telehealth across the dispersed communities of Oregon and manage the operations of the network.

The four primary goals that have been established to inform and guide the implementation of the Oregon Health Network area:

1. Oregon will achieve significant advances toward parity in its health related services across its urban, suburban and rural regions through the deployment of the OHN as an independent member organization.

2. The proliferation of successful telehealth applications across Oregon's most underserved areas will be attained through the active involvement of rural stakeholders, and a comprehensive program of education and technical support of rural network users.

3. The active and ongoing participation of rural providers in telehealth applications will be sustained by a sliding scale fee system.

4. OHN will establish a statewide broadband network and network applications that improve *access to* and *quality of* care in Oregon, as well as participate in development of a national health network that more fully serves the healthcare needs of all U.S. citizens.

The requirements for the OHN are easy to state and difficult to implement in a rural state like Oregon where the more than 50% of the land mass that is federally owned and operated does not participate in the state's economic viability. As stated previously, the OHN is intended to connect multiple disciplines. This pilot proposes the development of a **core member** constituency, which includes, but will not be limited to the following:

- Oregon Hospitals and clinics

- Rural, non-profit clinics and Federally Qualified Health Centers (FQHCs)

- Oregon's Community Colleges' major campus sites

Through interconnectivity with existing statewide networks, the OHN core constituency shall include Oregon's universities, public health and emergency management entities.

OHN is planned as a multi-vendor, value-added Internet Protocol (IP) network. This approach has several advantages:

- Competition from multiple vendors makes IP networking equipment costs lower.

- Nearly all network providers offer IP services assuring cost-effective coverage.

- OHN services can be offered privately and securely on existing physical networks.

Oregon has excellent backbone fiber optic infrastructure running through the state, with multiple distribution networks that can serve as a starting foundation for the needed statewide healthcare network. OHN plans to certify multiple backbone network vendors. Different network providers or combinations of network providers will serve different locations. An effective way to both reduce costs and improve network performance is to exchange local data traffic locally. OHN proposes to have four regional exchange points and multiple interconnecting points across the state. The regional exchange points are Portland, Eugene, Medford and the Bend/Redmond area.

A great portion of the budget for OHN project is proposed for bringing broadband services to rural hospitals, clinics, and other federally qualified health facilities that currently lack the kind of reliable, secure broadband network access necessary for health applications. OHN is attempting to establish the last mile and middle mile connectivity needed to bring broadband services to these rural and small

hospitals and clinics. Installation costs proposed are, in large part, for one-time costs of middle mile and last mile construction of broadband network capacity to core member constituents. The network must meet all the privacy and security requirements of the federal Health Insurance, Portability and Accountability Act (HIPAA) and relevant Oregon laws regarding access to medical information. These requirements will be met through the use of encryption and Virtual Private Network (VPN) services.

This comprehensive plan for establishing the Oregon Health Network has emerged from the wisdom, commitment and aspirations of a multidisciplinary Oregon leadership group. Collectively, they have fully grasped the healthcare challenges of a rural, significantly underserved Oregon population, and responded with both an infrastructure plan and a vision of improved health and well being for all Oregonians.

II. PROJECT SUMMARY:
BACKGROUND & STATEMENT OF PROBLEM

Project Summary:

Type of Proposal:	**Construct a dedicated broadband network**
Legal Applicant:	**Oregon Association of Hospital & Health Systems Research & Education Foundation (OREF)**
FCC/RHC Request:	**$ 20,182,625**
Matching Dollars:	**$ 4,520,938**
Service Area:	**The State of Oregon**
Rural Sites:	**The proposal will serve 79 rural communities**
Urban Sites:	**The proposal will serve 20 urban communities**

SUMMARY of FCC REQUIRED INFORMATION

1. Legal Applicant: Oregon Association of Hospital & Health Systems Research & Education Foundation (OREF). A full discussion of the legal applicant and management is found in Section III – Legal, Financial and Fiduciary Responsibilities.

2. Goals and Objectives: The OHN four project goals are as follows:

- Oregon will achieve significant advances toward parity in its health related services across its urban, suburban and rural regions through the deployment of the OHN as an independent member organization.

- The proliferation of successful telehealth applications across Oregon's most underserved areas will be attained through the active involvement of rural stakeholders, and a comprehensive program of education and technical support of rural network users.

- The active and ongoing participation of rural providers in telehealth applications will be sustained by a sliding scale fee system.

- OHN will establish a statewide broadband network and network applications that improve *access to* and *quality of* care in Oregon, as well as participate in development of a national health network that more fully serves the healthcare needs of all U.S. citizens.

A full discussion of goals and guiding principles is provided in Section IV – Proposal: Goals and Guiding Principles

3. Oregon Health Network Total FCC Related Cost: $24,703,563

Total Costs Year One: $10,349,454
Total Costs Year Two: $14,354,109

A full discussion of all project costs is found in Section IX – Oregon Health Network Costs.

4. Oregon Health Network: For Profit Participation

For-profit health-related organizations will be full participants in OHN without federal subsidy. A discussion of for profit participation is found in Section XII – Oregon Health Network: For-Profit Participation

5. Oregon Health Network: Sources of Funds: Non-recurring cost and recurring cost

FCC Request: $20,182,625

Matching Dollars: $ 4,520,938

A Full discussion of two-year sources of funds is found in Section IX – Oregon Health Network: Total Costs and summarized on the table below.

OHN: SOURCE OF FUNDS TABLE			
	Non-Recurring Costs	**Recurring Costs**	**Totals**
FCC Year 1	$7,729,950	$359,035	$8,088,985
FCC Year 2	$11,016,536	$1,077,104	$12,093,640
FCC Total	**$18,746,486**	**$1,436,139**	**$20,182,625**
Matching Year 1	$2,260,469	$0	$2,260,469
Matching Year 2	$2,260,469	$0	$2,260,469
Match Total	**$4,520,938**	**$0**	**$4,520,938**
GRAND TOTAL	**$23,267,424**	**$1,436,139**	**$24,703,563**

6. Health Care Facilities Included In the Oregon Health Network

The OHN will include the following core health and health related facilities:
- Oregon hospitals/69 sites, 34 of which are rural or frontier
- Non-profit clinics/53 rural sites; and all FQHCs/ 141 sites

- Oregon Community Colleges, including all major campuses/47 sites
- Public Health Networks, Oregon University Networks, and Emergency Management Networks, and other health sites that are connected to existing hospital networks /200 additional sites, bringing the initial total number of sites to 510.

A full list of participants is provided in Section VI – Health Care Facilities.

7. Address, Zip Code, RUCA Code, and Phone Number

The full participant information is provided in Section VI – Health Care Facilities.

8. Previous Experience

Experience and Expertise of the Applicant Organization, Telehealth Alliance of Oregon (TAO), and OHN Leadership is provided in Section XIII – Previous Experience: Development and Management of Telemedicine Programs.

9. Project Management Plan, Leadership, Structure, Work plan and Budget

The Project Management Plan, Leadership, structure and work plan is discussed in full in Section VIII – Project Management / Business Overview.

The Technical Work Plan is provided in Section V – A Network of Networks: Technical Requirement and Plans

The Budget is discussed in full in Sections IX – Oregon Health Network Total Costs, X – Financial Support/Source/Anticipated Revenue, XI – Sustainability and XII – Oregon Health Network: For-Profit Participation

10. OHN Coordination Statewide

A full discussion of the Coordination of the OHN is provided in Section VII – Coordination: State and Regionally / Telehealth Applications: Statewide Collaborative

11. Sustainability

A full discussion of project sustainability is provided in Section XI – Sustainability.

Purpose:

The purpose of this proposed project is to create a dynamic, effective, efficient, interoperable health network in Oregon to serve health care providers, health education institutions, public health systems and emergency management activities. The intent of this project is to create a statewide health network that builds upon existing regional broadband networks. The ultimate goal of this project is to participate in the development of a national health network that will serve the healthcare needs of all U.S. citizens. Two priorities are: (1) to create affordable broadband access to health facilities in the most rural and underserved areas of Oregon, and (2) to provide technical support and educational activities that promote adoption and delivery of telehealth applications across the expanse of Oregon.

The OHN will serve multiple purposes and entities that include:

- Connecting Oregon hospitals, clinics and physician offices with all Oregon state and county public health offices as well as all Oregon educational institutions that provide training for health care professionals or paraprofessionals;
- Interconnecting with both the Internet and Internet2/National Lambda Rail to reach relevant sites on those networks;
- Interoperability with Oregon public safety networks to coordinate disaster planning and response;
- Providing connections with health insurers for secure payment mechanisms and to Oregon pharmacies for secure electronic prescribing applications;
- Permitting secure accessibility via the Internet to permit authorized access from other locations, including for clinicians on call from their homes and for home health monitoring and communicating with patients in their homes;
- Permitting reliable data, digital image, digital voice and digital video transmission with sufficient quality for real time clinical instruction and medical consultations;
- Providing a network suitable for secure exchange of electronic medical records among those with appropriate authorization; and
- Saving travel costs by permitting multi-site videoconferencing for administrative conferences, clinical consultations, and education and training courses for certification and continuing education.

Background:

Visitors and new arrivals to Oregon are struck by the sheer size of the state. Driving from the city of
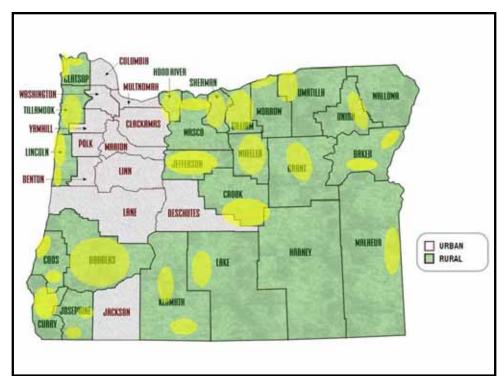
Ontario, near the eastern border with Idaho, to Astoria where the Columbia River meets the Pacific Ocean is just short of an eight-hour non-stop drive in the best weather. Traveling south to north, the distance from the California border to Astoria is slightly less than the distance through six states from Washington D.C. to Boston. But unlike I-95 on the East Coast, the drive from California to Astoria includes at least one mountain pass over 4,000 feet in elevation.

Even on Interstate highways, numerous passes and riverside routes extend travel times during winter months. Visibility can drop to a few feet for miles in dust or fog. Travel between rural population centers is even more challenging. The highway distance between the eastern Oregon town of Burns Junction and Holy Rosary Medical Center in Ontario is 129 miles, but it includes two passes over 4,000 feet in elevation and one over 5,000 feet. Winter weather makes travel hazardous at best and sometimes impossible.

The following map illustrates the counties designated "rural" by federal standards. Yellow highlights indicate rural county HRSA MUA/MUP areas. The U.S. Department of Health and Human Services Health Resources and Services Administration (HRSA) lists 59 Medically Underserved Areas and Medically Underserved Populations (MUA/MUP) in

Oregon. That exceeds any of the New England states, including Maine whose area and sparse population begin to approximate Oregon's challenges. This map understates the rural nature of Oregon. With the exception of three counties in the Portland Metropolitan Area, the counties shown as urban on this map are mostly rural counties that include a larger town or city within the county boundaries. Many of Oregon's counties are beyond rural and carry the designation of *frontier*; exhibiting extremely low population densities. Oregon's steady march toward a population of 4 million masks the reality that statewide population density is only 35.6 per square mile, less than half that of the U.S. overall. Even more dramatic is the fact that of Oregon's 36 counties, 14 have fewer than 11 persons per square mile, and 8 have 3 or fewer per square mile.

The obstacles faced by providers and patients in rural areas are a unique combination of factors that create disparities in healthcare. Economic factors, cultural and social differences, educational shortcomings, and the sheer isolation of living in remote rural areas all conspire to impede rural Americans in their struggle to lead healthy lives. Some of these factors, and their effects, are listed below:

- Rural residents tend to be poorer. On the average, per capita income is $7,417 lower than in urban areas, and rural Americans are more likely to live below the poverty level. The disparity in incomes is even greater for minorities living in rural areas.
- There are 2,157 *Health Professional Shortage Areas* in rural and frontier areas of all states and U.S. territories, compared to 910 in urban areas.
- Anywhere from 57 to 90 percent of first responders in rural areas are volunteers.

- Cerebrovascular disease is 1.45 times higher in rural areas than in standard metropolitan areas. Hypertension is also higher in rural areas at 128.8 per 1,000 individuals, compared to 101.3 per 1,000 metropolitan and urban residents.
- Medicare payments to rural hospitals and physicians are dramatically less than those to their urban counterparts for equivalent services. This correlates closely with the fact that more than 470 rural hospitals have closed in the past twenty-five years (*Rural Healthy People 2010*[1]; Ricketts, 1999[2]; Centers for Disease Control, 2001[3]).

Adding to the geographic challenge of being rural is one of a dramatically aging population. According to current projections by Oregon's Office of Economic Analysis, the number of Oregonians 65 or older will soon grow nearly 10% in just two years (2012 and 2013). Southern Oregon whose over age 65 population now stands at 17% (versus 12% nationally) is projected to reach 1 in 3 persons age 65 and over by the year 2020: 20-30 years sooner than the nation as a whole. Frail older adults are disproportionately represented as the majority of consumers within the health care system. They have a higher frequency of primary care visits, consume 50% of all hospital care, use over 80% of home care services, and occupy 90% of all nursing home beds in the United States (Mezey & Fulmer, 1998[4]). In the hospital setting, the over 65-age group utilizes the health system three to four times more frequently than those under age 65. The poignancy of healthcare needs and the rapidly rising elderly population compel the urgency to move toward an improved quality of care in Oregon's rural communities**.**

In 2001, the Institute of Medicine's report *Crossing the Quality Chasm: A New Health System for the 21st Century* described the current state of health care in the United States as "characterized by more to know, more to do, more to manage, more to watch, and more people involved than ever before." In addition, the report criticized the delivery of health care as "overly complex and uncoordinated, requiring steps and patient "handoffs" that slow down care and decrease rather than improve safety." In response to recommendations in this and other influential reports, President Bush announced a 2004 health care initiative that envisioned access to electronic medical records (EMRs) at the point of care for the majority of Americans. The Executive Order, *Incentives for the Use of Health Information Technolog*y*,* established as a goal the improved "coordination of care and information among hospitals, laboratories, physician offices, and other ambulatory care providers through an effective infrastructure for the secure and authorized exchange of health care information."

Although health information technology is not a panacea for all that ails the U.S. healthcare system, it stands poised to play an instrumental role in improving the quality of care, particularly in our most rural regions. This impact of poor telecommunications capacities on quality of service is illustrated anecdotally by a recent case in northern Umatilla County where a patient waited over four hours for a diagnosis as images were being circuitously transmitted via public Internet. This experience highlights concerns in Oregon about the current level of telecommunications capacity as a basis to support *telehealth,* including its potential to exchange patient information, extend the scope of available medical expertise, expand the hours of operation, or support remote specialty diagnostics.

Without adequate telecommunication capacities, the fact that a rural clinic exists does not insure that required life-saving services will be available. From neo-natal care to geriatric services, mental health to vehicular accident trauma, there are at least two very distinct levels of healthcare quality in Oregon—those enabled by robust technology and those without it.

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[1] *Rural Healthy People 2010: A Companion Document to Healthy People 2010. Volume 1.* College Station, Texas: The Texas A&M University System Health Science Center, School of Rural Public Health, Southwest Rural Health Research Center.

[2] Ricketts, TC, Rural Health in the United States. Oxford University Press, 1999.

[3] A National Call to Action: Center for Disease Control 2001 Urban and Rural Health Chartbook.

[4] Mezey, M. and Fulmer, T, Quality Care for the Frail and Elderly. Nursing Outlook, 1998, Nov-Dec; 46(6); 291-2.

The following statement from Silverton Hospital[5] describes the current network problem from the perspective of a small rural hospital in the eastern part of Marion County, the county that includes the capital city of Salem.

> "In our rural service area on the east side of Marion County, our hospital and clinics need access to fiber optic cable. The current T1 copper lines are not adequate to carry an increasing amount of electronic data. Since converting to digital imaging, our need for greater bandwidth continues to grow. Everyday around 3 o'clock the digital pipeline slows to a crawl. Radiologists are frustrated by the delays in conveying their diagnostic reports and images to referring physicians who need them.
>
> Just recently in response to physician demand for a multi-slice CT scanner, we learned that our hospital has no access to fiber. How frustrating that without fiber, a new 64-slice CT scanner would be almost useless. With increased bandwidth, added access points at our clinics, and high speed connectivity, our small hospital can advance with the field of medicine and bring the benefits of improved technology to those 65,000 residents of this rural area. We need affordable fiber to connect our five local clinics and hospital and local physician offices, as well as to connect with the skills and services of specialists at OHSU and other sites of advanced medicine.
>
> Our friends at the Salud Medical Center in Woodburn also need this vital pipeline. Salud is a federally qualified health center serving low income Latinos in our area. Their physicians use Silverton Hospital extensively for diagnostic studies, surgical services, obstetrical care, inpatient care and emergencies. Salud is part of the Yakima Valley Farmworkers Clinic[6], a network of nine medical clinics in Oregon and Washington. Sylvia Arroyo, executive director, says her clinic is connected to the medical records system at Silverton Hospital as well as a system used at all clinics in their network, but the slow speeds are a daily frustration in patient care and diagnostic imaging files are not available to them.
>
> Gervais Telephone/Data Vision Communications is a small, community-active provider now laying fiber in parts of our service area, including a stretch of Highway 214 in Woodburn where the buried cable passes in front of Salud and four of our clinics, yet none are connected. According to John Hoffman, manager, there is an eight mile gap between the hospital and their closest hub which may cost as much as $400,000 to bring in fiber optic cable.
>
> Silverton Hospital is a busy little hospital with 49 beds, Joint Commission accredited and honored last year as a Solucient Top 100 Hospital. Our 18-bed Family Birth Center averages 150-160 births per month, more than double other Oregon hospitals twice our size, and just received the J.D. Power and Associates' Outstanding Patient Service Award for Maternity Care. There are 103 members of the active Medical Staff. Silverton is about 15 miles east of Salem; clinics in Mt. Angel and Woodburn bring primary care medical services close to those who reside in small towns and the surrounding agricultural areas of the fertile Willamette Valley."

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[5] http://www.silvertonhospital.org/index.php
[6] http://www.yvfwc.com/

Additional dimensions to Oregon's growing healthcare access problem are race and culture. Long a home to immigrant farm workers, rural Oregon faces language barriers in providing healthcare that can be mitigated through the use of Internet-based translation services. In the decade prior to 2000, Oregon's Hispanic population grew 144%, then another 12.4% between 2000 and 2002. This has placed additional strain on a system already trying to function with bandwidth capacity better suited to hobbyists that telemedicine.

The picture on the healthcare supply side is no brighter. Post-secondary healthcare education is no better equipped to cope with these realities than healthcare providers themselves. Blue Mountain Community College, based in Pendleton, Oregon, offers 11 allied health programs from Emergency Medical Technician (EMT) certification to nursing degrees. The college is faced with delivering classes to an 18,000 square mile rural service area with laboratory facilities only in Pendleton. Literally the only way many allied health students can complete their studies is in distance learning format via over-burdened T1, Digital Subscriber Line (DSL), and dial-up Internet access. Video conferencing can be so unreliable that instructors abandon it for phone contact with students. The community of Enterprise, where BMCC has a learning center in the mountainous northeastern corner of the state, has one Internet link for healthcare, education, government, and private use—an aging microwave with limited capacity. Oregon's geography, demographics and inadequate infrastructure combine to form a "perfect storm" for its citizens. A rural population scattered over great distances limits access to care to the point where every year, Oregonians literally die from the inability to get timely medical help. Add the decreased mobility of an aging population, and the problem of healthcare access becomes almost unimaginable.

The obstacles inherent in Oregon's geography and demography serve as foundation to this proposal, and add strength to the need for a statewide health network if Oregon is to avoid its impending healthcare catastrophe. Avoidance can be accomplished through the implementation of a well designed information technology highway, built in conformance with the standards for interoperability, prototypes for architectures, product certifications, and privacy and security that are now being explored as a component of the national Health Information Technology Initiative. Even if it takes years to maximize the telehealth capacity of the infrastructure proposed in this request, it will not be a moment too soon to cope with the demand placed on healthcare resources in the rural Oregon areas. Without the ability to give rural healthcare providers enhanced telehealth capacities, poor quality care due to lack of access and expertise will be epidemic, and *sub-optimal* will be the standard of care. The cost for implementation on a state level is daunting, but the need is irrefutable. This OHN telehealth *network of network*s is not just an option; it is essential to a better future for a storm threatened, aging, underserved rural Oregon population.

III. LEGAL, FINANCIAL & FIDUCIARY RESPONSIBILITIES

Legal and Fiduciary Responsibility for the FCC Pilot

The Oregon Association of Hospitals and Health Systems Research and Education Foundation (OREF) is the applicant organization to the FCC Pilot Program. OREF is an Oregon non-profit corporation with Internal Revenue Service certification as a section 501(c) 3 non-profit organization. The administrative and fiduciary governance of the OHN will be contracted to OREF for a minimum of two years. A determination will be made during that period as to when and how a transition to independent OHN operation and administration of the network should be accomplished.

During the first two years of the OHN, operational leadership and organizational management will be assumed by TAO, with the continued guidance of the OHN Leadership Committee. During the first year of the FCC pilot program, this leadership will take all appropriate actions to incorporate the OHN and establish it as an independent, non-profit member organization. When the OHN is incorporated as a legal entity, the current OHN Leadership Committee will be constituted as the OHN Founding Board of Directors. For developmental continuity, this founding Board of Directors will serve for the first three years of the OHN's operation. During this initial three-year period of time, a full statewide OHN membership roster will be established, and all subsequent Board of Directors will be elected by the OHN membership. Once the OHN is legally established, the following organization and governance model shall be used to govern the OHN. This governance plan will be operational by the second year of the FCC pilot program, and will serve the OHN in its subsequent years of operation.

Ongoing OHN Organization and Governance

By the completion of the FCC pilot program, the Oregon Health Network will be legally constituted as a private, non-profit member organization, comprised of one representative of each OHN member. Member fees shall be affordable and shall be constructed as a recurring annual cost to network members. These fees will not include charges for telecommunications transport charges, which will be paid directly to telecommunications network vendors. The OHN members shall elect the OHN Governing Board, and shall ratify by majority vote the annual budget and operating plan of the OHN. The governing principle will be one member, one vote, with equal representation from participating members. The OHN Board will determine how they are organized, how services will be contracted, and how costs are shared. They will review financial status, give overall direction to the network, and approve contractual relationships with service providers. To help them in their work, the board will create 3 to 5 standing committees, whose members will be drawn from participating OHN organizations. Additionally, an Advisory Committee to the Board will be constituted whose membership shall be comprised of leading experts, either from member organizations or from the telehealth field at large.

The initial committees will be as follows:

- **Applications Committee** will conduct oversight on Oregon Health Network applications and usage. This committee will be charged with applications oversight, including expansion of rural telehealth services; technical support to rural users, tracking applications use; and coordination of applications and services among network members statewide.
- **Security Coordination and Technology Committee** will be charged with technical oversight of the Network to include recommending guidelines for security agreements, technology, design and standards for interoperability among health care providers statewide to facilitate the sharing of health information as appropriate.

- **Finance Committee** will have oversight of OHN financial operations. This includes negotiating and maintaining contractual relationships with the Oregon Association of Hospitals and Health Systems (OAHHS), which will serve as the fiscal agent for the OHN. Day-to-day financial operations will be the responsibility of the OAHHS as a contract service. OHN will benefit from the support and management expertise of OAHHS as the fiscal agent for the initial two years of the project.
- **Health Alliance Committee** will coordinate the network applications across the allied health related core constituents, including offerings of the state's higher educational institutions, community colleges, and others involved in distance learning and e-course health care education and initiatives of public health and emergency management; all brought together toward an interdisciplinary health alliance by the OHN.

The OHN Board Advisory Committee will be as follows:

The Advisory Committee will be comprised of many of the leading experts in the Telehealth field in Oregon and others who have pioneered the implementation and expansion of telecommunications services across the state. This group may include representatives of the OHN membership, or may be recruited from the telehealth field at large. The primary responsibility of the Advisory Committee will be to provide counsel and guidance for the strategic development of the OHN organization.

The OHN leadership has given considerable thought and attention to the process and specific activities that will be required to incorporate the OHN as an independent member organization, with a fully operating governance and committee structure and with a fully engaged membership and well defined channels of communication among constituent members statewide. The following Process Work plan delineates the major milestones, responsibilities and timeline that are anticipated to be undertaken by the OHN leadership during the pilot period to ensure a fully operational OHN. The OHN leadership is assuming responsibility for the process work plan. No subsidy for the activities identified below is being requested from the FCC.

IV. GOALS & GUIDING PRINCIPLES

Development and implementation of the proposed OHN project is based on the following four primary goals and related principles:

1. Oregon will achieve significant advances toward parity in its health related services across its urban, suburban and rural regions through the deployment of the OHN as an independent member organization.

While information technology and broadband capacity is rapidly increasing among health care systems nationally, this remains predominantly a movement in urban settings and within the largest health care systems. Rural, small and mid-sized systems, often those in the most medically underserved areas, have found information technology, as a basis for expanded and improved care, to be cost prohibitive. Even where urban centers have reached out to their rural partners for development of telehealth services, the rural entity is often not an equal partner in the collaboration. This project will empower rural and midsize communities to achieve service parity with their urban counterparts by developing the OHN as an independent 501(c)(3) member organization operating under the principle of one member, one vote. In the first year of this pilot program, the OHN will be incorporated as an independent member organization, with its own governance and committee structure, elected by the membership, and guided by a committee structure that is representative of the member organizations. This helps to ensure that strategic development of the OHN and its operational practices will continue to evolve with the interests and advancement of *all* its members.

   Principles:
   - The OHN Leadership Committee, in partnership with the Oregon Association of Hospitals and Health Systems (OAHHS) and the Telehealth Alliance of Oregon (TAO), will establish OHN as an independent, non-profit and tax-exempt member organization.
   - Small, mid-sized and large organizations will be equal partners under the premise of one member, one vote.
   - The cost to administer and manage the OHN will be an ongoing component of the OHN sustainability plan.
   - OHN will be organized and operated in a way that widely attracts health, education and emergency management members. It will also be widely accepted and utilized by existing health care networks and hospitals.
   - A Board of Directors, representing and elected by the membership, will determine decision-making processes, cost sharing, contract service awards and management.
   - OHN committees, including an Applications Committee, Security Coordination and Technology Committee, Finance Committee, and Health Alliance Committee, will represent and be drawn from the member organizations.
   - An Advisory Committee comprised of network members and/or leading telehealth experts will guide and advise the strategic development of the OHN.
   - Operational management of the OHN will be maintained as a contracted service.

2. The proliferation of successful telehealth applications across Oregon's most underserved areas will be attained through the active involvement of rural stakeholders, and a comprehensive program of education and technical support of rural network users.

   Federal goals for this decade identified in Healthy People 2010 have recognized rural localities as areas of special concern, stating, "Rural populations experience more heart disease, cancer, and diabetes than urban populations. Rural populations are also more likely to lack timely access to

primary healthcare providers, emergency response services and specialty care, necessitating strong relationships of cooperation between regional medical centers and rural communities."

Thoughtful implementation of proven and emerging technologies can play a critical role in improving the access to and quality of rural health care. National efforts are underway to address the massive technological challenges confronting us. The challenges on the human level are equally daunting. Aside from the sizeable capital and deployment costs involved, provider staffs often resist redesigning workflow processes, learning new systems, or utilizing the very options that hold the most promise to expand and improve services and care. The major factor that has been demonstrated as vital to successful technology deployment and sustained operation of telehealth systems involves both the active engagement of the system stakeholders and a sustained system of training and technical support. Therefore, education and technical support for rural users will be a guiding premise of this effort.

> Principles:
> - OHN will address the education and technical support of rural stakeholders, essential to the successful deployment of health related applications.
> - OHN will help meet impending regulatory pressures to share health information.
> - Priority for proliferation of applications shall initially extend to rural and underserved areas.
> - OHN will improve rural access to quality care through telehealth.
> - Technical Assistance services of OHN will help members apply for and secure all available technical support services and subsidies.
> - Applications needs and use studies will be an ongoing activity of OHN.

3. The active and ongoing participation of rural providers in telehealth applications will be sustained by an OHN sliding scale fee system and on-going FCC and other rural health subsidy programs.

Affordability is central to the design and utilization of a successful broadband health network, particularly in our most rural, underserved regions. The current lack of broadband access in rural and mid-rural communities across the nation is demonstration of inadequacy of the current mechanisms that support rural expansion. Currently, commercial telecommunications business plans are not meeting the need for rural broadband expansion and sustainability. To provide redress to constraints that currently inhibit rural broadband expansion, this project will employ three strategies for financial realignments resulting in a sustainable health network: 1) federal subsidy to support network expansion, including rural areas; 2) cost efficiencies derived from aggregated use/costs across health, education and emergency management sites; and 3) a cost sharing across the full system of stakeholders, to include users, payers, and vendors in order to provide subsidy to rural users across Oregon. OHN believes that these fiscal strategies will, in combination, build and sustain an infrastructure and expanded telehealth applications across rural, urban and suburban Oregon, which will stand poised to connect to a national health network, ready to serve all U.S. citizens.

> Principles:
> - OHN fees will be on a sliding scale, with lower fees for smaller and more rural health facilities.
> - Universal Service funds will continue to be available to subsidize access in rural locations.

- Aggregated use across health, education and emergency management, including for-profit health care providers, will help support increased capacity and services at reduced unit costs.
- The cost to health, education and emergency management members will be justified by the added value derived, including increased capacity and quality.
- Affordable connectivity statewide will stimulate increased deployment of telehealth applications.
- Additional costs incurred to administer, manage, and provide technical assistance will be borne fairly by network stakeholders.
- Funding is realistic and sustainable.

4. OHN will establish a statewide broadband network and network applications that will improve *access to* and *quality of* care in Oregon, as well as participate in the development of a national health network that will improve the healthcare services available to all U.S. citizens.

Health information technology (HIT) can increase access to healthcare in our most rural and underserved areas. Telehealth applications are an essential tool to improve quality of care across the health care continuum. It provides a vehicle for data exchange that enables vital information and decision support to be accessible at the point of care across the complex system of care. Safe, reliable and secure exchange of data, digital image, digital voice and digital video transmission with quality sufficient for real time clinical instruction and medical consultations is both a federal priority as well as a healthcare imperative.

This project will create a digital broadband network that would securely and privately interconnect all Oregon hospitals, clinics, physician offices, including mental health, dental, and optical clinics, for the provision of telehealth services. It will also connect Oregon hospitals and clinics with all Oregon state and county public health offices and Oregon educational institutions that provide training for health care professionals or paraprofessionals. The network will interconnect with both the Internet and Internet2/National Lambda Rail to reach relevant sites on those networks. It will be interoperable with Oregon public safety networks to coordinate disaster planning and response. It will also connect with health insurers for secure payment mechanisms and to Oregon pharmacies for secure electronic prescribing applications. The network would be securely accessible via the Internet to permit authorized access from other locations, allowing clinicians while on call from their homes to provide home health monitoring and to communicate with homebound patients as well. It will become the platform for an expanded and enhanced state health care system. A state, regional and national health network is more then the wave of the future, it is an urgently needed tool that can rectify the deficiencies of today's uneven, inadequate and error riddled system of care.

Principles:
- OHN will be a *Network of Networks* that will build upon the autonomy and integrity of existing networks.
- New network connections will be created and existing networks expanded to provide broadband connectivity to *all* interested health related providers and services, to include secure payment mechanisms and electronic prescribing applications.
- The OHN will develop a sustainable plan that attends to both infrastructure and applications.
- OHN will interconnect with both the Internet and Internet 2/National Lambda Rail to reach relevant sites on those networks.
- OHN will be interoperable with health education and emergency management
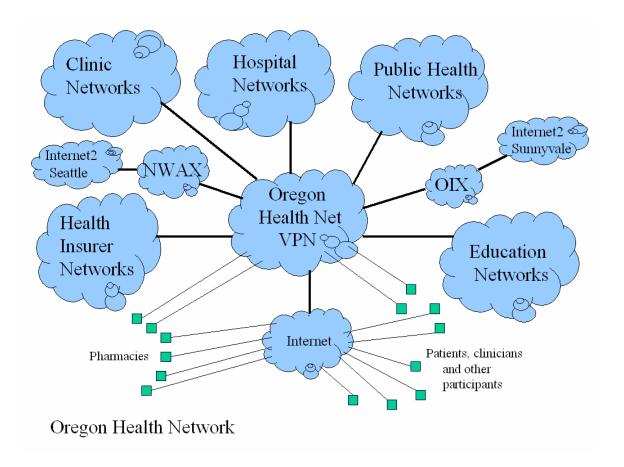
networks.

- The health network will be reliable, scalable and provide secure access to authorized users.
- Issues of architecture, standards, security and interoperability will be developed and maintained in conformance with existing and emerging national standards.

These four goals and their accompanying assumptions will be reflected in the specific components of the OHN project plan. The result is a cohesive, comprehensive plan that creates an efficient, cost-effective Oregon infrastructure and system of health-related applications geared to improve access to and quality of health care in Oregon's rural communities and across the state.

V. A NETWORK OF NETWORKS: TECHNICAL REQUIREMENTS – TECHNICAL PLAN

OHN will be a **Network of Networks**. The intent is to embrace and extend rather than replace or duplicate current networks. A number of health networks already exist in Oregon.

Oregon Health Network

1. **The Southern Oregon Medical Network (SOMN)** connects 11 hospitals and clinics in Ashland, Grants Pass, Klamath Falls and Medford. Sites include: Rogue Valley Medical Center, Three Rivers Community Hospital, Ashland Community Hospital, Merle West Medical Center, Hematology Oncology Assoc, Oregon Advanced Imaging, Providence Medford Medical Center, Siskiyou Imaging, Southern Oregon Orthopedics, Surgery Center, Medford Radiology Group, and 400 plus physicians through the Asante MD (Physician Portal).

2. **The Cascades Network** connects several sites over a wide geographic region of central and eastern Oregon. Sites include: St. Charles Medical Center - Bend, St. Charles Medical Center - Redmond, Blue Mountain District Hospital - John Day, Harney County District Hospital - Burns, Lake District Hospital - Lakeview, Mid-Columbia Medical Center - The Dalles, Mountain View District Hospital - Madras, Pioneer Memorial Hospital – Prineville.

3. **The Samaritan Health Services Network** connects together five hospitals and more than 30 clinics in its service region. Sites included are: Good Samaritan Regional Medical Center, Corvallis, OR; Albany General Hospital, Albany, OR; Lebanon Community Hospital, Lebanon, OR; North Lincoln Hospital, Lincoln City, OR; Pacific Communities Hospital, Newport, OR; and 30+ clinics in Benton, Linn and Lincoln counties.

4. **Frontier TeleNet** in eastern Oregon currently has connections to Asher Clinic in Fossil, Gilliam County Medical Center in Condon, Moro Medical Center in Moro, and Arlington Medical Center in Arlington. By the summer of 2007 Frontier TeleNet plans to complete connections to Mid-Columbia Medical Center in The Dalles, the Clinic at the Confederated Tribes of the Warm Springs in Warm Springs, St. Anthony's Hospital in Pendleton, Mountain View Hospital in Madras and Klickitat Valley Hospital in Goldendale, Washington.

5. **Oregon Health & Science University (OHSU)** connects eight clinics in the Portland metropolitan area and two rural health facilities, the Elgin Family Health Center in Elgin and the Union Family Health Center in Union.

6. **The Providence Hospital Network,** also based in the Portland metropolitan area includes: 73 sites in Oregon in the following communities: Portland (34 sites), Beaverton - 1, Mt Angel - 1, Woodburn - 1, Lake Oswego -1, Clackamas -1, Hood River (5), Newberg (5), Sherwood -1, Gresham (4), Hillsboro (2), Mt Hood Meadows -1, Aloha (2), Vernonia -1, Tigard (3), Seaside -1, Cannon Beach -1, Gearhart -1, Medford (4), Shady Cove -1, Jacksonville -1, Central Point -1.

7. **The Peace Health Network** connects the Sacred Heart Medical Center, Eugene; Peace Harbor Hospital, Florence; Cottage Grove Community Hospital, Cottage Grove; Peace Health Medical Group Clinics, Eugene; Southern Lane Medical Group, Cottage Grove and Cresswell; and 500 plus independent physician practices in the Eugene area.

8. **OCHIN** currently connects 14 primary sites and 36 rural clinics in Oregon. They will connect to OHN through the NERO network. (See connections to other networks discussion below.)

9. **State of Oregon Network** connects 26 public health agencies or branches that will connect to OHN through the state government network. (See connections to other networks in Section VII – Coordination: State and Regionally.

One of the first tasks for OHN will be to interconnect the existing health networks in Oregon. Much of the medical network traffic will continue to be in the existing regional networks because of the local affiliation arrangements, longstanding cooperative relations characteristic to Oregon and the obvious advantages of clinics working with their nearest hospital. Connecting the existing networks together will increase the opportunities for specialty consults and access to services not readily available in the local region, and facilitate the transfer of medical records and medical imaging data when patients are transferred. It will increase the range of medical services that can be offered within each region through the addition of telemedicine applications provided by secondary or tertiary hospitals. OHN will also help the existing regional medical networks extend their reach to more rural locations. The OHN connections to Internet2, Oregon state government, education networks and public safety networks will bring additional advantages to the existing networks. In some cases, the connectivity may be achieved at prices comparable to what the users are now paying for Internet access or permit them to purchase greatly expanded network connectivity at prices lower than they would otherwise pay for such expanded capacity.

This planned OHN network of networks has similarities to the Internet. Each of the existing networks and

many independent clinics or other health facilities already connects to the Internet. This raises the obvious question: Why not just use the Internet for OHN connectivity? The answer is cost and performance. The Internet is indeed suitable for non-time sensitive applications when sufficient broadband access to the Internet is available. However, in many instances, the costs of Internet access with sufficient bandwidth for rapid transmission of medical imaging data may be prohibitive. Most health systems in Oregon buy Internet access bandwidth in units of "T1" lines, which is telephone industry terminology for approximately 1.5 megabits per second of data capacity. Some large hospital systems in Oregon have a total of less than 10 Mbps of Internet access for their entire system. They find that during peak congestion periods serious delays in transmission of medical images result and degradation of videoconference connections make them unusable. OHN, by interconnecting all Oregon facilities, will permit Oregon traffic to be handed off in Oregon, reducing the amount of bandwidth required to reach the rest of the Internet. The cost per bit for Internet access decreases as the volume of leased capacity increases. OHN will concentrate demand in addition to enabling new applications. This will enable health systems to purchase cost-effectively the bandwidth required to support needed applications.

The Internet is currently not suitable for real-time telehealth applications in Oregon because of long out of state transit delays, dropped data packets and jitter (variable arrival time) in the data transmission. Several Oregon health systems, including OHSU, Samaritan, St. Charles and Asante, have videoconferencing facilities they use for communication within their own networks. However, interconnection of those systems through the Internet has demonstrated that, while they can be made to work much of the time, they are not reliable and do not have sufficient quality for most medical education uses and are not suitable for patient medical consultations when the public Internet is used for connectivity. The public Internet is a "best effort" delivery system that is not good enough for real time medical applications. OHN will be a network of networks, like the Internet, but with a managed quality of service suitable for real time medical applications. Like the Internet, it will be a network with the intelligence at the edges, thereby permitting the development of new applications running over the network without requiring changes to the network. Just as the public Internet stimulated a wave of applications innovation that Thomas Friedman celebrates in his book, *The World is Flat*,[7] OHN will stimulate new health care applications with the introduction of a secure Internet Protocol network suitable for real time applications.

Oregon Health Network Technical Requirements

The purpose of OHN is to make it easy for digital medical communication applications to be connected privately and securely to and among health and health related facilities anywhere in the state of Oregon. Applications will include medical imaging (teleradiology), transmission of electronic medical records, health monitoring telemetry, video conferencing and other medical applications. Video conferencing applications will include administrative, educational and medical consultation uses. To make the network affordable, OHN will use network infrastructure that Oregon already has rather than build another special-purpose network.

The telehealth infrastructure build-out proposed by the Oregon Health Network is the transition plan to the desired level of statewide healthcare service in Oregon. Some characteristics of that desired level of service are known:

- 24/7/365 system availability
- Fiscal sustainability
- Administrative accountability
- Support for real-time telehealth procedures

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[7] Thomas L. Friedman, *The World Is Flat*, Farrar, Straus and Giroux, New York, NY 2006.

- Secure exchange of electronic health records
- Support for healthcare education

OHN is planned as a multi-vendor, value-added Internet Protocol (IP) network. This approach has several advantages:

- The ubiquitous nature of IP as a widely used and preferred communications protocol is making equipment costs lower, thanks to competition from multiple vendors.
- The greatest cost-effective geographic coverage is ensured, as nearly all network providers today offer IP services. Competition among network vendors helps ensure effective economics.
- OHN services can be offered privately and securely on existing physical infrastructure using virtual circuits and networks, saving the cost of deploying a dedicated network.

The preferred minimum bandwidth for a small clinic will be 10 Mbps (10 million bits per second) bi-directional to permit transmission of medical imaging records and to permit H.323 standard[8] videoconferencing at a quality level sufficient for medical consultations between a patient at one location on the network and a clinician at another location. Most Digital Subscriber Line (DSL) and cable modem services do not provide a sufficiently "broadband" access link for these applications. Small rural hospitals are expected to need at least 100 Mbps of network access capacity and larger hospitals are expected to need a Gigabit per second (one billion bits per second) of network access capacity. Network service will be offered in transmission speeds of 10 Mbps, 100 Mbps and 1 Gbps.

Oregon hospitals and clinics, including those with adequate bandwidth, have found that the public Internet does not provide consistent satisfactory quality for real time applications such as videoconferencing, even though it can be used for less time sensitive applications such as medical imaging reports. This is in part because Oregon does not have any major Internet interconnection points and almost all Oregon Internet traffic, even between two physically close locations in Oregon, goes out of state and through many "routers" before coming back to its Oregon destination. The typical circuitous routing of Oregon Internet traffic results in too much transit delay for real-time applications to work properly. It also results in some data packets being dropped (which doesn't matter for non-real time applications because they will be retransmitted). Dropped data packets ruin the quality of real-time applications, such as videoconferencing. A variable delay in the time data packets arrive at the destination, called "jitter", is also a problem for real-time applications. Consequently, the OHN technical specifications will require at least 99.95% availability, a maximum latency (delay) of seven milliseconds on all access links, a maximum latency of 20 milliseconds on the longest network transport links, and tight specifications for jitter.

The underlying physical network components[9] for OHN may be any technology that supports the network applications, including fiber optics, copper, wireless or other technology. Where practical, the data link layer[10] should use Ethernet[11] standards to connect with user equipment and interconnect the local area networks (LANs) of OHN members without the need for protocol conversion. The current metro Ethernet standard[12] is specified for network interconnection, with a possible later transition to carrier Ethernet[13]

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[8] http://www.webopedia.com/TERM/H/H_323.html
[9] Layer one of the Open Systems Interconnection (OSI) Model. See http://en.wikipedia.org/wiki/Osi_layers .
[10] Layer two of the OSI model.
[11] http://en.wikipedia.org/wiki/Ethernet
[12] http://www.webopedia.com/TERM/M/Metro_Ethernet.html
[13] http://www.webopedia.com/TERM/C/Carrier_Ethernet.html

when those standards are fully adopted. The network layer[14] will be Internet Protocol version 4 (IPv4), with a possible later transition to IPv6 when that version becomes more generally available.

As an interim service for locations that do not yet have access to Ethernet services at speeds of 10 Mbps or greater, OHN will accept layer 3 (Internet Protocol) connections at speeds and performance capability other than that specified above. Lower quality access will permit some applications, including transmission of electronic medical records, even though the quality may not be sufficient for some real-time applications.

The geographic requirements are easy to state and hard to implement with the preceding technical specifications in a rural state like Oregon. OHN should connect every hospital, every medical clinic (including dental, optical and mental health clinics), every state and county public health department location and every community college or other educational institution providing training or continuing education for medical professionals and paraprofessionals anywhere in the state of Oregon. In cases where medical facilities in a neighboring state are in the service area of an Oregon hospital, connectivity will extend into neighboring states. If both Oregon and Washington are successful in creating statewide health networks, OHN intends to connect the two networks into a larger regional network.

Oregon is blessed with much fiber optic network capacity throughout the state that can be used for OHN. However, what most rural locations (and some urban locations) lack is the last-mile broadband capacity necessary to reach clinics for health applications. In addition, many rural communities lack middle mile broadband connectivity between their communities and the fiber optic backbone networks that run throughout the state. Consequently, most of the costs for initial network implementation will be for one-time costs of middle mile and last mile construction of broadband network capacity.

The network must meet all the privacy and security requirements of the federal Health Insurance, Portability and Accountability Act (HIPAA) and relevant Oregon laws regarding access to medical information. These requirements will be met through a combination of encryption, virtual private network (VPN) services and services offered at higher layers of the OSI model. For example, the Eclipse Foundation[15] is working on developing open source software that may provide a platform for secure medical applications to run over networks, including the OHN. Their Open Health Care framework is being adopted by many and is the basis for a new Open Health Information Project[16] being hosted at Oregon State University's Open Source Lab. Ready access to this software and the people developing it will help OHN develop specifications for security and other requirements for applications used over the network. Specifications for security and other application requirements will be developed in more detail later at higher layers of the OSI model than the bottom three layers that make up the OHN technical foundation.

The final network requirement is one of providing connectivity and interoperability with other networks. Much of the information needed by medical facilities in Oregon will be available from sites on the Internet or on Internet2/National Lambda Rail, which will be available to OHN members. Health facilities need interconnectivity with public safety networks for coordination in disasters and disaster planning exercises. Health facilities need connectivity with commercial service providers, such as health insurance networks, pharmacy networks, language translation and billing services. They also need connectivity to state and local government networks that provide services to public health facilities and higher education networks carrying health care education services. OHN will provide connectivity to

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[14] Layer three of the OSI model
[15] http://www.eclipse.org/
[16] http://osuosl.org/node/59

these other networks.

Connection to community colleges will be particularly important since community colleges in Oregon provide most of the nursing and medical paraprofessional training in the state, usually in cooperation with local hospitals for clinical training. Currently, Oregon does not have a community college telecommunications network, so such connectivity for medical training applications will be part of OHN. OHN will also plan ahead for future network connectivity requirements, including home health monitoring applications and connectivity with patient-oriented Personal Health Record (PHR) databases. Oregon is a leader in developing such connectivity applications. For example, the RxSafe project[17] is connecting medical prescription records from hospitals, clinics, pharmacies and assisted living facilities in order to improve medication safety among the frail elderly. In addition, the Oregon Health Information Security and Privacy Collaboration (HISPC) Team has been identifying effective and appropriate security and privacy best practices to protect personal health information and ensure compliance with HIPAA and Oregon state law.

Network Planning Process

Early in the OHN planning process, the leadership team established a technical committee to develop the technical plans for OHN. Members included technical representatives from several Oregon health systems, including Chief Information Officers (CIOs), technical representatives from Oregon educational institutions, and technical representatives from a large number of Oregon telecommunications providers. Membership was open so that no potential vendor or user was excluded. Several meetings of this committee produced a consensus draft network plan that was summarized in a formal Request for Information (RFI). That RFI was posted on the Telehealth Alliance of Oregon website[18] and was mailed to every telecommunications provider in the state of Oregon using the Oregon Public Utility Commission list of all Oregon service providers. Even though the time available to respond was very short, because of the impending FCC deadline for pilot project applications, 24 responses were received. The responses validated the draft network plan by indicating at least one, and usually more, competitors for every element of the plan. Responders to the RFI were promised that their confidential information would be protected. All members of the RFI review committee signed both non-disclosure agreements and non conflict of interest agreements certifying that the review committee members and their organizations were not responding to the RFI and would not respond to any subsequent request for proposals. Details of the network plan, based on the consensus draft network plan and more detailed RFI responses, are summarized in the following sections.

Network Operations Center (NOC)

The network plan includes an OHN network operations center (NOC) that will permit end to end monitoring of network performance. It will also permit independent measurement of whether providers of network components and links are meeting the specifications promised in their service agreements. Further, it will provide technical assistance to users when needed. This network operations center will provide the glue needed to hold the entire network of networks together, ensure the necessary quality of service and provide a single point of contact for users with network problems. It will provide continuous network monitoring 24 hours a day, seven days a week, with staffing necessary to respond to user trouble calls and to isolate and resolve any network problems.

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[17] http://www.ohsu.edu/orprn/RxSafe/index_about.html

[18] http://www.ortelehealth.org/OHN%20RFI%20Final%20with%20links.pdf

The networks being interconnected to create OHN were not originally designed to support interactive/synchronous applications. As anyone who has attempted to use H.323-based conferencing over disparate wide area IP carriers can confirm, service quality varies and generally is unsuitable for telemedicine. The NOC will be responsible for establishing, monitoring, and enforcing appropriate availability and performance service levels for the network. Oregon's IP network is not a homogeneous whole, but is a collection of networks offered by a variety of providers, including many that compete with each other. The NOC will provide a credible, vendor-neutral authority to ensure reliable operations. Security on the network is also a critical requirement. The network will be used to transport sensitive patient data including electronic medical records, and will be subject to HIPAA requirements. While the primary responsibility for compliance rests with the application providers, NOC coordination with the network providers can help ensure overall system integrity.

To make the costs affordable, OHN will contract for services from a network operations center that already provides 24 hour per day, seven day per week monitoring for other applications. The Network Operations Center (NOC) will:

- Be contracted by, and report to, the governing board of OHN.
- Function independently of any network transport service provider.
- Establish, in conjunction with the OHN board, the technical requirements to become a member of the OHN for service providers and end users and provide initial compliancy assurance.
- Provide the engineering resources to design and implement the monitoring system, including at end points for each user site.
- Provide training and support to the member network providers for the installation and maintenance of end point devices and other monitoring tools, as required.
- Provide network monitoring capability to each of the Network Exchange Points (NXPs) and Network Interconnection Points (NIPs), member network service providers, and end user locations.
- Monitor end-to-end performance and work to resolve issues that degrade performance below specified levels
- Provide network performance data to everyone in the OHN: the OHN board, member network providers, application providers, end user sites, and other parties as determined by the OHN board.
- Perform ongoing testing of the network to verify that appropriate service levels are available
- Coordinate communications between network service providers, provide feedback on network performance, and assist in troubleshooting across multiple networks.
- Provide consulting assistance to application developers to assist in their efficient operation on the network.

The budget for the NOC is based on using an existing Network Operations Center that currently provides similar service to other applications using open source software network monitoring tools. The initial incremental NOC hardware required for OHN is $50,000, including servers and H.323 monitoring hardware/software. In addition, low-cost end-user monitoring equipment, with specialized open source software, will be installed at user sites. The current conservative budgetary estimate is for a one-time equipment cost of $200 per end user site. During the first six months, a network manager and two full time equivalent (FTE) engineers will be required to develop the platforms and services. For the remainder of the project a network manager and one engineer will be required. Oregon Health & Science University and Portland State University faculty and senior network engineering staff have committed to support the NOC development efforts. Annual network oversight and monitoring costs per month per site are estimated to be $50 for a 535-site network. The software used will be open source software. See

Attachment A for a preliminary list of network management software tools.

Backbone Networks

Oregon has excellent fiber optic infrastructure running through the state. Based on RFI responses, multiple network vendors will be able to provide backbone fiber optic capacity meeting the requirement for a self-healing fiber optic ring through the major population centers of the state, including the Interstate Highway 5 corridor from Portland in the north to Medford in the south, connecting through the Bend/Redmond area in central Oregon, and back to Portland. Different potential backbone network providers have networks reaching into different more rural areas of the state.

Rather than select a single backbone network vendor, OHN plans to certify multiple backbone network vendors. Certification will be based on agreement to meet OHN technical specifications and agreement to exchange data traffic at multiple exchange points on the network as described below in the next section. Payment to backbone network providers will come from users obtaining network access from their locations to OHN exchange points rather than from a single contract with OHN. Users will want the lowest price for network connectivity from their specific locations with a bundled price that includes both network access and network transport. Each end-user organization will want a contract with a single network vendor providing a Service Level Agreement (SLA) that guarantees the appropriate quality of service for an agreed price. If desired by individual OHN members, OHN could serve as an agent for negotiating network service agreements, but individual members would be the customers of record with the serving carriers. Local network access providers in different parts of Oregon already have network transport arrangements with different long-haul providers and may be able to provide lower costs to end users through their existing arrangements.

To take best advantage of the competitive nature of telecommunications services in Oregon, the choice of which combination of local access and long haul network transport arrangements should be determined competitively and may be different in different geographic locations. Since Oregon has more than 30 incumbent local exchange carriers and a larger number of competitive local exchange carriers, competitive long distance carriers, and Internet service providers, there is no 'one size fits all' general solution that could be dictated by a central authority. What is needed is a competitive network procurement process that seeks the best service quality and price for each specific location to be served. Different network providers or combinations of network provider will serve different locations. Educational institution and state and local government locations requiring connection to OHN may find that using existing educational or government networks may be the most cost-effective way. They, as well as other network members, will also have the option of choosing the most appropriate network vendor for their location in a competitive procurement.

One potential commercial backbone network provider committed in its RFI response to pass though to the OHN NOC (on a passive, read-only basis) network monitoring information gathered at its network operations center. Another potential backbone network provider has indicated that, even though they have their own network operations center and network monitoring capabilities, they would not be willing to allow OHN access to that information. OHN access to the internal network monitoring of carriers providing service is desirable but not essential because OHN will have its own end-to-end network monitoring capability.

No budget is provided for backbone network costs independent of local network access costs because costs of access and transport will be bundled together and reported in the network access section below.

Network Exchange Points (NXPs)

An effective way to both reduce costs and improve network service quality is to exchange local data traffic locally. Connecting local traffic locally improves the quality of those transmissions by reducing the transmission delay time, reducing the number of dropped data packets and reducing the network jitter (variable arrival time of data packets). It also reduces the need for expensive bandwidth to send that traffic to a distant location, only to have it sent back to a nearby location. In telecommunications, as in other industries, improving quality usually decreases costs, making it a win-win proposition.

OHN proposes to have four regional exchange points, in Portland, Eugene, Medford and Bend/Redmond. In health care applications, perhaps even more than in other applications, a high percentage of the data traffic will be relatively local, for example, between a regional hospital and clinics in its serving area. Exchanging that traffic locally will go a long way to improve service quality and reduce costs. As networked health care services later expand into home health monitoring and other applications connecting patients and health care providers, the importance of keeping local traffic local will increase.

OHN plans to use existing network exchange points in Portland and Eugene. The Northwest Access Exchange (NWAX)[19] is a carrier-neutral exchange located in the building in Portland that has more telecommunications facilities and networks than any other location in the state. It was established by OHSU and Portland State University. The switching infrastructure of NWAX would need to be substantially upgraded to meet the additional OHN requirements. NWAX has proposed that OHN pay for 50 percent of the non-recurring capital cost of upgrading its facilities with two Cisco 6500 switches or equivalent, at approximately $120,000. Recurring costs will be paid through the fees NWAX charges to connecting carriers.

The Oregon Internet Exchange (OIX),[20] located at the University of Oregon in Eugene, is Oregon's oldest carrier-neutral general-purpose exchange. OIX has agreed to serve as the Eugene exchange location for OHN. Connecting carriers will pay co-location fees for rack space and power and will pay the network costs of connecting to OIX. No additional budget is requested from OHN for exchanges services at OIX.

Southern Oregon currently does not have a carrier-neutral exchange facility. The cost of creating such a facility specifically for OHN would be prohibitive. What is proposed instead is a distributed exchange arrangement in Medford with the involvement of four telecommunications providers. One proposed OHN backbone network provider has points of presence in both the central office of the incumbent telephone service provider and in a co-location facility provided by a local competitive exchange carrier. Both of these local providers will permit additional providers to co-locate in their facilities. The long distance carrier that is already co-located in both facilities also interconnects with the communications provider that is the primary carrier for the Southern Oregon Medical Network (SOMN). This distributed exchange arrangement already provides connectivity among the major providers in the region and offers two possible physical locations for interconnection with additional network providers. No additional OHN funds are needed for this existing arrangement.

Oregon has no carrier-neutral exchange facility east of the Cascade Mountains. However, a telecommunications provider that provides service to a large number of health facilities in the region has a co-location facility in the Bend area with staffing twenty-four hours a day seven days a week. The current least-cost plan for that region is to suggest using the co-location facilities of that carrier. Carriers or

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[19] http://www.nwax.net/

[20] http://darkwing.uoregon.edu/~oregonix/

29

Internet Service Providers currently connected to this facility include 360 Networks, Bend Broadband, Clearwire, Community Broadband, Chambers Cable of Sunriver, Eschelon Telecommunications, Network for Education and Research in Oregon (NERO), Northwest Telephone, Inc., RIO Communications, Quantum Communications, Qwest, and Webformix.

Network Interconnection Points
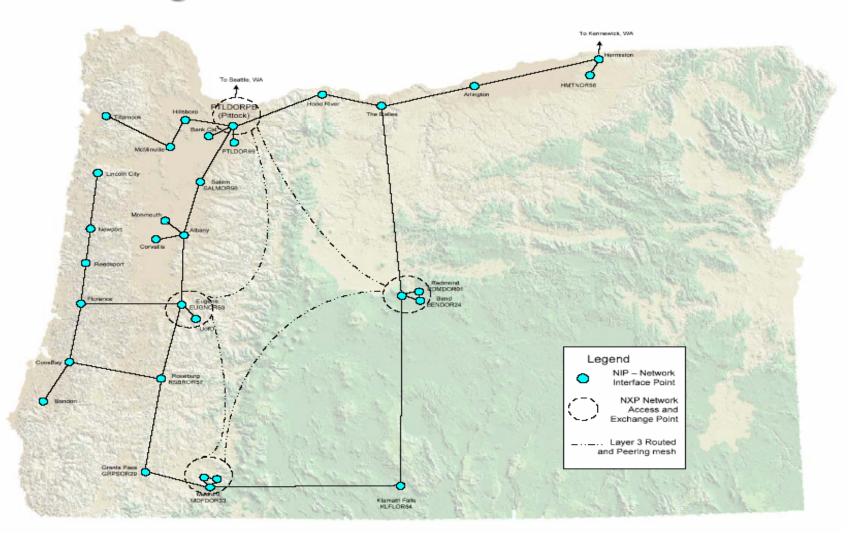
To reduce the costs of connection to OHN from rural Oregon locations it will be important to have network interconnection points (NIPs) throughout the state. The more network interconnection points, the shorter the path and lower the costs for access providers to connect end users to the network. As the network grows, additional NIPs (sometimes called Points of Presence or POPs) will be added. OHN backbone providers will continue to add additional locations where they will provide Ethernet interconnection with access vendors.

The currently committed list of network interconnection points is:

The currently committed list of network interconnection points is:

Albany	Lincoln City
Arlington	McMinnville
Bandon	Medford
Bend	Monmouth
Coos Bay	Newport
Corvallis	Portland
Eugene	Redmond
Florence	Reedsport
Grants Pass	Roseburg
Hermiston	Salem
Hillsboro	The Dalles
Hood River	Tillamook
Klamath Falls	

Oregon Health Networks: NIP's and NXP's

Oregon Health Network: NIPs & NXPs
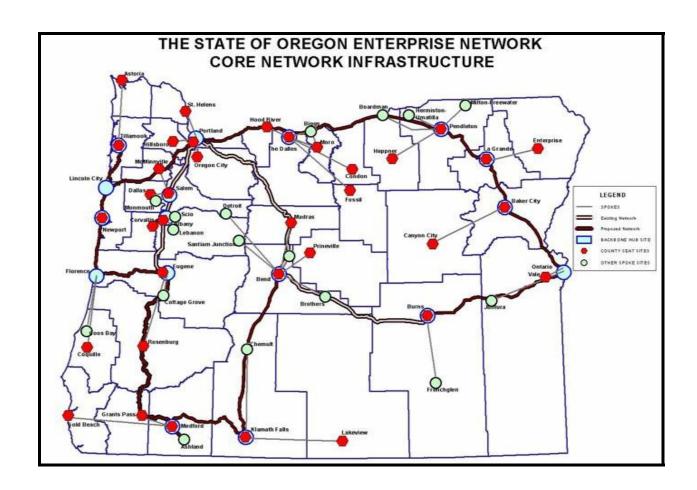
Connections with Other Networks

Connections to Internet2/National Lambda Rail will be valuable for OHN members to reach health-related, educational and research institutions in the rest of the country. Two respondents to the OHN Request for Information proposed different ways to connect to Internet2 (and presumably National Lambda Rail when the two networks complete their planned merger). Each of the proposals has different advantages and disadvantages. Each of the proposals provided budgetary costs of approximately $200,000 for two years of service, including the $25,000 per year fee charged by Internet2. It appears prudent at this time to defer the decision on which connectivity arrangement to use until the pilot program funding is available and a competitive procurement can be made to determine the most cost-effective arrangement. By that time there should be further clarity concerning the consequences and opportunities resulting from the planned merger of the two national research and education networks. If both Washington and Oregon receive funding for health networks under this FCC program, and both networks connect to Internet2, then no further funding would be needed to interconnect the two state networks through Internet2 for a broader northwest regional network.

For connectivity to the public Internet (called by educational institutions the "commodity Internet") OHN will depend on private sector competitive forces to determine the appropriate connectivity solution for each end user location. Some clinics and health systems may have arrangements with Internet Service Providers (ISPs) that will continue to be attractive for them. Some may have long-term agreements that would be more cost-effective to maintain than cancel. Some access providers may offer attractive bundled options that include both OHN and Internet access. Some OHN members might wish to obtain their commodity Internet services from a local ISP that chooses to exchange Oregon Internet traffic at one of the OHN Network Exchange Points (NXPs), thereby making it more likely that Internet connections with their patients and local suppliers have a more efficient path.

OHN will also connect with Oregon's state government network, which is currently being upgraded. The planned state of Oregon Network will be a redundant Gigabit Ethernet (Gig E) network with 8 Hubs in the core (see diagram below). A Gig E spur will extend from Medford to Central Point (Southern Emergency Command Center) and then to White City (Jackson County Building). Initially there will also be two 100 Mb spur hub sites located in Eastern Oregon at Pendleton and LaGrande, which will both be homed at the Pittock Building in Portland. Future expansion of the LaGrande Spur calls for a Gig E redundant path to Baker City, Ontario, Vale, Burns, Bend and back to the Pittock in Portland. These sites will then become hub locations to remote end sites. Future growth along the Coastal route from Brookings to Astoria is being planned. The state has a 24-hour NOC to handle its more than 2000 end site location needs.

THE STATE OF OREGON ENTERPRISE NETWORK
CORE NETWORK INFRASTRUCTURE

Today these end sites are connected through T-1 Frame Relay Circuits at 1.08Mbps throughput. The state will continue to upgrade those sites to Digital T-1 at 1.544 Mb, local fiber at 10Mb or higher, satellite at 1.5Mb and various DSL Speeds.

The State of Oregon Network connects to County and other Health Agency locations. Non-profit businesses are allowed to use the state network for transport. The state will manage these networks and connect them to the OHN at the OIX and NWAX locations. The State mental hospital and Eastern Oregon State Hospital are part of this network. The Medical Management Information System, Public Health, and other medical applications run on this network and the security meets HIPAA compliance. The State of Oregon Network carries data transport of several emergency management agencies and applications including Amber Alerts, TripChek, OSP, Office of Emergency Management and LEDS. The State Network is also working with the Oregon Wireless Interoperability Network to provide interoperability with first responders throughout the State, which will include communications to the local Health Providers around the state.

The health agencies served by the State Network are listed in the table below.
Health Agencies Served by the State Network*
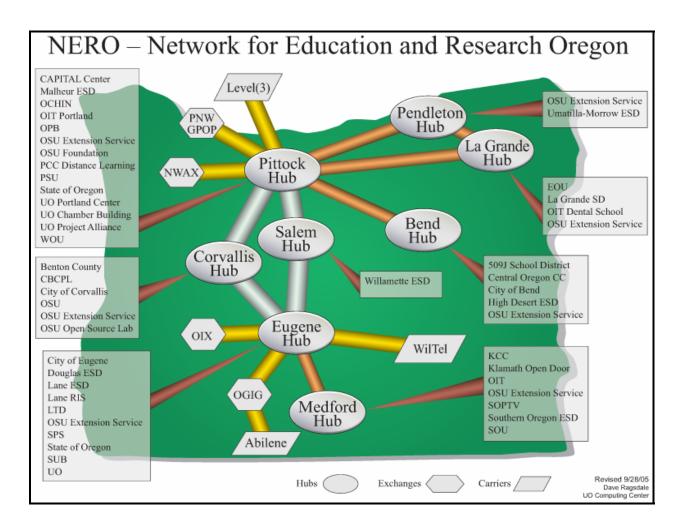
Human Services - AS Office of Info Services
Human Services - HS Office of Public Health
Human Services - HS Program Operations
Human Services - HS PHO Public Health
Human Services - HS Disease Prevention
Human Services - HS Public Health System
Human Services - HS Family Health Services
Human Services - HS Public Health Labs
Human Services - Seniors & People with Disabilities
Counselors & Therapists Board
Long Term Care Ombudsman
Psychologist Examiners Board
Clinical Social Workers Board
Psychiatric Security Review Board
Chiropractic Examiners Board
Health Licensing Office
Pharmacy Board
Radiologic Technology Board
Board of Dentistry
Medical Examiners Board
Nursing Board
Mid-Columbia Center for Living
Eastern OR Psychiatric Center
County - Douglas Health & Social Services
Oregon Child Development Coalition
Greater Oregon Behavioral Health Inc

*some of these agencies have multiple locations

Oregon's Education Community has a long history leading innovation in Research and Education Networking. Through leadership in Internet2 (several institutions were charter members of Internet2 and the University of Oregon initiated the Sponsored Education Group membership model to include K-12), the Network for Education and Research in Oregon, and the Portland Research and Education Network, Oregon's education community has a proven track record on inclusion, collaboration, and innovation which has led to robust statewide Research and Education Networks leveraging both owned fiber optic facilities and leased services from standard carriers. Statewide initiatives have already connected every K-12 school in Oregon to the Internet and Internet2, and have laid the groundwork for expanding the community of interest to include health care communities.

The Network for Education and Research in Oregon (NERO) is a statewide network that delivers Internet access to more than half a million public school students, nearly 100,000 university students, and all public agencies. The network further provides citizens a gateway to electronic information at Oregon libraries, public agencies, and to distance education offerings, and is needed for advanced research by Oregon University System (OUS) institutions. NERO will provide the OHN connectivity with the higher education institutions in the state.

For-profit health care organizations, including clinics and doctors' offices, are prohibited by Oregon law from using either NERO or the state government network, and will connect directly with OHN. Institutions already served by NERO or by the state government network will connect to OHN through those networks. Non-profit health care institutions may have a choice of how to connect and are expected to choose the connections with the best cost and service quality options available to meet their needs. In many cases, the NERO, state government network and OHN backbone networks may be using fiber optic transport from the same underlying transport provider on the same routes. The NERO network coverage is illustrated schematically below.

OHN Connections to Oregon state government and education networks will take place at the exchange points. Oregon government and educational networks already exchange data traffic at NWAX in Portland and/or OIX in Eugene, two primary OHN exchange points. Most of the state and county public health facilities in the state will be connected to OHN through the Oregon state government network, which will serve as the OHN backbone network for government facilities, with interconnections at both NWAX and OIX. Similarly, the state's higher education network, the Network for Education and Research in Oregon (NERO) will interconnect with OHN at both NWAX and OIX to provide connectivity to and from the health education and medical research facilities at Oregon's universities. No additional budget is required to achieve such connectivity. Public safety networks in Oregon are in the initial stages of a major network upgrade as a result of the need to improve inter-operability for security and disaster response applications. OHN will work with public safety networks in Oregon to encourage them to also interconnect at the

exchanges, most likely through the state government network. The value of any network increases with the number of points connected to the network. Encouraging all Internet Protocol (IP) networks in Oregon to interconnect at the exchange points should benefit all.

Technical details of interconnection arrangements with all other networks will be determined during the network engineering phase with the goals of 1) separating OHN instate traffic from general Internet and Internet2 connectivity, 2) providing choice in ISP services to members, and 3) having a framework that is scalable and supportable by the OHN NOC.

Last Mile and Middle Mile Connectivity

The network components described in the preceding sections are essential to make the applications and services of the Oregon Health Network available to hospitals and clinics throughout Oregon. Without those network components OHN would be unable to offer appropriate services to health facilities in rural locations. Connecting urban hospitals to OHN is essential to having medical services accessible to rural locations through the network. A key benefit of OHN will be to establish the last mile and middle mile connectivity needed to bring the broadband services that OHN can provide to rural hospitals and clinics.

The OHN RFI requested budgetary estimates for both non-recurring and monthly recurring costs for network capacity to connect rural health care locations to the OHN backbone network at one of the network exchange points (or through one of the network interconnection points). No restrictions were placed on the technology used for last mile and middle mile connectivity, provided performance specifications are met. In some locations service might be provided on copper transport, in others on fiber optic cable and yet others by wireless networks. In some communities there is adequate middle mile capacity linking the community to the rest of the state. For those communities, network construction would be required only for last mile facilities from a central office to the end user clinic location. In other communities, "middle mile" facilities need to be constructed to permit broadband connections from that community to the OHN backbone. Given the diversity of rural Oregon, which is primarily a sparsely populated rural state, despite the urban population concentration in Portland and the upper Willamette Valley, there is no "one size fits all" network technology solution. OHN will seek the best competitive solution for each different location to be served.

A number of different telephone companies, cable companies, competitive local exchange carriers, wireless carriers and long distance network providers responded to the OHN RFI with proposed solutions for the different parts of the state they serve. Some offered local access solutions that would need to be paired with an appropriate long distance ("backhaul") provider. Others offered long distance solutions that need to be paired with the solutions of local providers. Still others offered end-to-end solutions for connecting their community health facilities to the Oregon Health Network exchange points. Collectively, the RFI responses have proposed constructive solutions and budgetary estimates for connecting health care locations throughout most of the state of Oregon. Nevertheless, some rural locations would be left without service if we limited the network plans to only those providers responding to the RFI. Cost estimates for reaching those locations are estimates projected from the budgetary numbers of those that did respond.

Specific budgetary numbers for specific sites were submitted as proprietary information, given the competitive nature of telecommunications in Oregon. The RFI respondents understood that the budgetary numbers they provided would be used in this application for funding. They also understood that no contracts or service agreements would be signed until after a formal competitive procurement process.

Section VI – *Health Care Facilities*, contains the name, address, phone number and Rural-Urban Commuting Area (RUCA) code of all the OHN service locations that will be available on the OHN when all the existing networks sites are interconnected (these sites are shown on the Participation List in bold);

36

as well as all the new sites that will be brought onboard through the middle mile and last mile solutions proposed herein (these sites are shown as not bolded).

Table 8 in Section IX, Financial Plan, provides an aggregate summary of the budgetary proposals for all installations and two year NOC and Internet2 costs. Installation costs for interconnecting existing networks are shown on the first line of table 8, labeled *Sub-Total/Networks;* where as last mile and middle mile one time construction and installation costs, are organized and summarized by region and type of facility. Year one and year two breakdown of these costs are also shown on Table 8. Total OHN pilot cost is in the amount of $23,267,424 of which $18,746,486 is being requested from the FCC and $4,520.938 is being provided as match.

OHN intends that the individual health facilities will be the customers of record responsible for recurring service payments for network services connecting their facility to OHN. OHN will conduct the competitive procurement process to obtain the best services and prices. In some cases, it is possible that OHN will make the contractual arrangements as agent for the individual health facility. OHN anticipates that, in most cases, the network billing to the end user facilities will be a bundled price that includes local access, middle mile connectivity charges and OHN backbone network charges. In cases where one vendor provides local access and another provides the long-haul transport, two network vendors may bill the end user customer. However, a single point of billing and network contact and responsibility is preferable for network accountability. This will be important in the event service levels fail to meet the quality specified in the service agreements with respect to transit delay, jitter and frequency of dropped packets.

If the pilot program funding available for OHN from the FCC is less than the amount requested, OHN will accept funding at a lower level and complete as much of the network as possible with the available funds. This will require prioritizing which locations will be funded first and which will be delayed until additional funds can be found.

A number of criteria will be considered in how locations will be prioritized for funding. Some of these may include:

- Connecting facilities that are fully committed to paying the recurring costs necessary for sustainability
- Connecting facilities that can be reached first as middle mile lines are extended
- Connecting as many rural hospitals as can be afforded, preferably all
- Connecting facilities in each of the seven Health Resources and Services Administration (HRSA) regions of the state, so that no region is slighted
- Connecting community colleges offering training for health care personnel
- Connecting Federally Qualified Health Centers located in rural locations
- Connecting facilities in communities that already have adequate middle mile connectivity to the OHN backbone network
- Interest and commitment to initiate telehealth applications

For most sites, including those not eligible for subsidy, cost savings may also be available because of the opportunity for reduced Internet access charges, compared to what the facilities are now paying. This will partly result from the off-loading of current Internet traffic to OHN or Internet2 and partly from the new competitive pricing options for Internet access that will be available as competitive providers bid to provide services to OHN members.

Planned Procurement Process
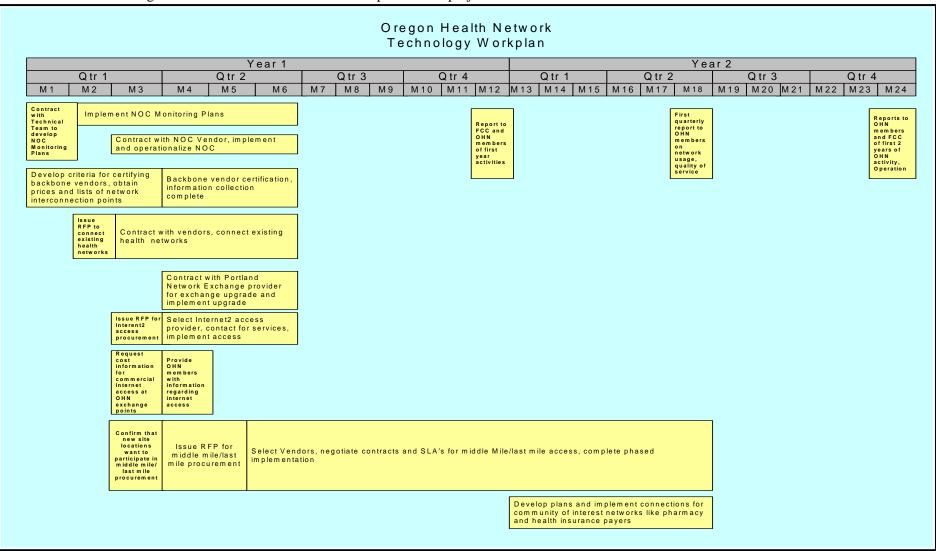
The budgetary numbers used in this proposal, based on the telecommunications service provider responses to the OHN RFI, are useful estimates for budget planning purposes. However, the real test will come in a formal competitive request for proposals (RFP) process that OHN will conduct in accordance with any applicable FCC rules and regulations when the funds become available. This will not be a procurement seeking a single winning bidder for the entire network. There will be one winner for the Network Operations Center (NOC) contract. Different network vendors are expected to win different components of the project, depending on the service they choose to offer and the geographic locations in which they offer them. OHN may choose one winning bidder for the collective OHN to Internet2 connection arrangements, if that appears to be the best way to make those connections. Alternately, if one or more bidders should propose to offer Internet2 connectivity directly to OHN members, whether or not bundled with other services, such as commercial Internet access, the selection could be made on a site-specific basis without selecting an exclusive network-wide access provider. OHN will be the customer contracting for NOC services, and possibly for Internet2 access services. Commercial Internet access services will not be contracted centrally. Each OHN member will contract for commercial Internet service directly with an Internet Service Provider (ISP). It is possible that OHN may be able to arrange to have competing ISPs offer commercial Internet service at one or more of the OHN exchange points in order to help OHN members achieve lower Internet access prices.

For all OHN members, the contractual network arrangements for OHN network transport services will be between the OHN members and their network providers, even though OHN will conduct a collective RFP process and, in some cases, act as an agent for OHN members. An early step in the RFP process will be to reconfirm with potential backbone network vendors, which ones will agree to connect their traffic at multiple network exchange points (at least two) and reconfirm the list of network interconnection points at which they will accept traffic from other network vendors. With that information in hand, the competitive procurement process will be one in which OHN seeks competitive bids for connection from each of the desired hospital, clinic, community college, or public health facility locations to the network exchange points. OHN anticipates that different network transport and network access vendors will be the successful bidders in different geographic locations. Each network transport vendor will be asked to quote prices for transporting OHN member data from the specific facility locations they propose to serve to multiple OHN network exchange points, including at least the closest geographic location and the exchange location nearest the OHN NOC. They may provide such services directly themselves or jointly with one of the backbone network providers. OHN network vendors will be asked to commit contractually to meeting OHN quality of service standards.

In cases where an existing network is being connected to OHN, a single OHN network connection may serve all the facilities that are already part of that network. However, for connections from individual rural locations on existing networks that may be eligible for and wish to apply for subsidy from the rural health universal service program, new bids will be requested for service to those locations. This will be necessary to ensure that the subsidy for recurring costs does not exceed the difference between the lowest bid for service at that location and price for comparable service at urban locations, as required by the FCC. This part of the procurement process will be optional for individual locations that are part of an existing network connecting to OHN. However, rural sites that do not participate would not be eligible for subsidy.

Technical Work Plan Summary

The following chart summarizes the technical work plan for the project.

Oregon Health Network
Technology Workplan

Year 1												Year 2											
Qtr 1			Qtr 2			Qtr 3			Qtr 4			Qtr 1			Qtr 2			Qtr 3			Qtr 4		
M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	M13	M14	M15	M16	M17	M18	M19	M20	M21	M22	M23	M24

Contract with Technical Team to develop NOC Monitoring Plans

Implement NOC Monitoring Plans

Contract with NOC Vendor, implement and operationalize NOC

Report to FCC and OHN members of first year activities

First quarterly report to OHN members on network usage, quality of service

Reports to OHN members and FCC of first 2 years of OHN activity, Operation

Develop criteria for certifying backbone vendors, obtain prices and lists of network interconnection points

Backbone vendor certification, information collection complete

Issue RFP to connect existing health networks

Contract with vendors, connect existing health networks

Contract with Portland Network Exchange provider for exchange upgrade and implement upgrade

Issue RFP for Interent2 access procurement

Select Internet2 access provider, contact for services, implement access

Request cost information for commercial Internet access at OHN exchange points

Provide OHN members with information regarding internet access

Confirm that new site locations want to participate in middle mile/last mile procurement

Issue RFP for middle mile/last mile procurement

Select Vendors, negotiate contracts and SLA's for middle Mile/last mile access, complete phased implementation

Develop plans and implement connections for community of interest networks like pharmacy and health insurance payers

VI.   NETWORK: HEALTH CARE FACILITIES
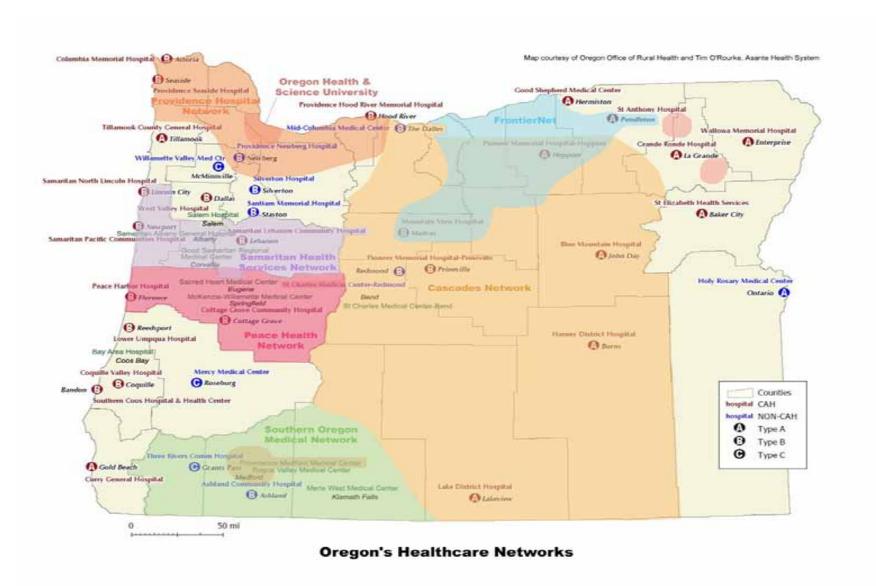
The health care and health education facilities that will participate in the project are listed in this section. They are broken down in four categories: 1) Hospitals; 2) Rural Health Clinics (RHC's); 3) Federally Qualified Health Centers (FQHC's); and 4) Community Colleges and their branch locations.

As outlined in the FCC Docket, OHN has provided the name, address, zip code, Rural Urban Commuting Area (RUCA) code and the telephone number of each health care facility participating in the network. In addition, when applicable, OHN also include the county in which the facility is located and whether the hospital is a critical access hospital.

We are introducing this section with a visual that defines the service area of the ORH. As you can see on the following map, almost all of the eastern two-thirds of Oregon (east of the Cascade Mountains) is considered **RURAL and FRONTIER.** The majority of the more populated western third of the Oregon (west of the Cascades) is also rural.

The following map shows the footprints of Oregon's existing healthcare networks. None of the networks are the same in terms of bandwidth used, equipment used or mode of transmission.

Oregon's Healthcare Networks

A.   HOSPITALS

Hospitals – OHN believes that the network must include all hospitals and health systems in Oregon in order to achieve maximum efficiency and effectiveness. Two hospital tables are included in this section. One includes rural hospitals that will be eligible to receive funding and the other includes the urban hospitals. Several of the hospitals classified as urban are located in communities of slightly more the 20,000 and are critical to the success of the rural health clinics surrounding them.

Rural Hospitals:

Hospital Name	City	Address	Zip	Phone	County	Type	CAH	RUCA	MUA	HPSA
Columbia Memorial Hospital	Astoria	2111 Exchange St.	97103	503-325-4321	Clatsop County	B	TRUE	4		
Providence Seaside Hospital	Seaside	725 S Wahanna Rd	97138	503-717-7000	Clatsop County	B	TRUE	7.4	A	
Tillamook County General Hospital	Tillamook	1000 Third	97141	503-842-4444	Tillamook County	A	TRUE	7	A	LI
Providence Hood River Memorial Hospital	Hood River	811 13th St.	97031	541-386-3911	Hood River County	B	TRUE	4	A	MSFW
Providence Newberg Hospital	Newberg	501 Villa Rd	97132	503-537-1555	Yamhill County	B	FALSE	2		LI
Willamette Valley Med Ctr	McMinnville	2700 Three Mile Ln	97128	503-472-6131	Yamhill County	C	FALSE	4.2		LI
Mid-Columbia Medical Center	The Dalles	1700 E 19th St	97058	541-296-1111	Wasco County	B	FALSE	4	P	MSFW
Samaritan North Lincoln Hospital	Lincoln City	3043 NE 28th	97367	541-994-3661	Lincoln County	B	TRUE	7	P	LI
Good Shepherd Medical Center	Hermiston	610 NW 11th	97838	541-567-6483	Umatilla County	A	TRUE	4	A	MSFW
West Valley Hospital	Dallas	525 SE Washington	97338	503-623-8301	Polk County	B	TRUE	4.1	P	MSFW
Silverton Hospital	Silverton	342 Fairview	97381	503-873-1500	Marion County	B	FALSE	4.2		MSFW
St Anthony Hospital	Pendleton	1601 SE Court Ave	97801	541-276-5121	Umatilla County	A	TRUE	4		MSFW
Samaritan Pacific Communities Hospital	Newport	930 SW Abbey	97365	541-625-2244	Lincoln County	B	TRUE	7		
Santiam Memorial Hospital	Stayton	1401 N 10th Ave	97383	503-769-2175	Marion County	B	FALSE	2		MSFW
Pioneer Memorial Hospital-Heppner	Heppner	564 E Pioneer Dr.	97836	541-676-9133	Morrow County	A	TRUE	10		G
Samaritan Lebanon Community Hospital	Lebanon	525 N Santiam Hwy	97355	541-258-2101	Linn County	B	TRUE	4		MSFW
Grande Ronde Hospital	La Grande	900 Sunset Dr	97850	541-963-8421	Union County	A	TRUE	4		

Hospital Name	City	Address	Zip	Phone	County	Type	CAH	RUCA	MUA	HPSA
Wallowa Memorial Hospital	Enterprise	401 NE First	97828	541-426-3111	Wallowa County	A	TRUE	10		
Mountain View Hospital	Madras	470 NE A Street	97741	541-475-3882	Jefferson County	B	TRUE	7	P	LI
Peace Harbor Hospital	Florence	400 Ninth Street	97439	541-997-8412	Lane County	B	TRUE	7		
Lower Umpqua Hospital	Reedsport	600 Ranch Rd	97467	541-271-2171	Douglas County	B	TRUE	7.4	P	LI
St Charles Medical Center-Redmond	Redmond	1253 N Canal Blvd	97756	541-548-8131	Deschutes County	B	FALSE	4.1		
Pioneer Memorial Hospital-Prineville	Prineville	1201 NE Elm	97754	541-447-6254	Crook County	B	TRUE	4		LI
St Elizabeth Health Services	Baker City	3325 Pocahontas Rd	97814	541-523-6461	Baker County	A	TRUE	7	A	
Cottage Grove Community Hospital	Cottage Grove	1515 Village Dr.	97424	541-942-0511	Lane County	B	TRUE	2		
Blue Mountain Hospital	John Day	170 Ford Rd	97845	541-575-1311	Grant County	A	TRUE	10		G
Coquille Valley Hospital	Coquille	940 E 5th Street	97423	541-396-3101	Coos County	B	TRUE	7.2		LI
Southern Coos Hospital & Health Center	Bandon	900 11th St SE	97411	541-347-2426	Coos County	B	TRUE	7.4		LI
Mercy Medical Center	Roseburg	2700 Stewart Pkwy	97470	541-673-0611	Douglas County	C	FALSE	4	P	LI
Holy Rosary Medical Center	Ontario	351 SW 9th	97914	541-881-7000	Malheur County	A	FALSE	4		LI
Harney District Hospital	Burns	557 W Washington	97720	541-573-7281	Harney County	A	TRUE	7		LI
Curry General Hospital	Gold Beach	94220 E 4th Street	97444	541-247-6621	Curry County	A	TRUE	10	A	
Three Rivers Comm Hospital	Grants Pass	715 NW Dimmick	97527	541-472-7000	Josephine County	C	FALSE	4.2	A	
Ashland Community Hospital	Ashland	280 Maple Street	97520	541-482-2441	Jackson County	B	FALSE	1	P	LI
Lake District Hospital	Lakeview	700 South J Street	97630	541-947 2114	Lake County	A	TRUE	7		

Urban Hospitals:

OREGON'S URBAN HOSPITALS						
Hospital	City	Address	Zip	Phone	County	RUCA
Bay Area Hospital	Coos Bay	1775 Thompson Rd	97420	541-269-8111	Coos County	4
Merle West Medical Center	Klamath Falls	2865 Daggett Ave	97601	541-882-6311	Klamath	4
Adventist Medical Center	Portland	10123 SE Market	97520	503-251-6150	Multnomah	1
Doernbecher Children's	Portland	3181 SW Sam Jackson Park Rd.	97201	503-494-8311	Multnomah	1
Kaiser Sunnyside Medical Ctr	Clackamas	10180 SE Sunnyside Dr	97015	503-652-2880	Clackamas	1
Legacy Emanuel Hospital	Portland	2801 Gantenbien	97227	503-413-4008	Multnomah	1
Legacy Good Samaritan Hospital	Portland	1012 NW 22nd Ave	97210	503-413-7711	Multnomah	1
Legacy Meridan Park Hospital	Tualatin	19300 SW 65th	97062	503-692-1212	Washington	1
Legacy Mount Hood Medical Ctr	Gresham	24800 SE Stark	97030	503-674-1191	Multnomah	1
McKenzie-Willamette Medical Ctr	Springfield	1460 G Street	97477	541-726-4400	Lane	1
Mercy Medical Center	Roseburg	2700 Steward Pkway	97470	541-673-0611	Douglas	4
Oregon Health Sciences Univ. Hospital	Portland	3181 SW Sam Jackson Park Rd	97201	503-494-8311	Multnomah	1
Providence Milwaukie Hospital	Milwaukie	10150 SE 32nd	97222	503-513-8300	Clackamas	1
Providence Portland Medical Ctr	Portland	4805 Glisan	97213	503-215-1111	Multnomah	1
Providence St. Vincent Medical Ctr	Portland	9205 SW Barnes Rd	97225	503-216-1234	Multnomah	1
Rogue Valley Medical Ctr	Medford	2625 E Barnett Rd	97504	541-789-4900	Jackson	1
Sacred Heart Medical Center	Eugene	1255 Hilyard	97440	541-686-7300	Lane	1
Salem Hospital	Salem	665 Winter Street	97309	503-541-5200	Marion	1

Hospital	City	Address	Zip	Phone	County	RUCA
Samaritan Albany General	Albany	1046 W 6th Ave. SW	97321	541-812-4000	Benton	4.2
Shriners Hospital for Children	Portland	3101 SW Sam Jackson Park Rd	97207	503-241-5090	Multnomah	1
Providence Medford Medical Center	Medford	1111 Crater Lake Ave.	97504	541-732-5000	Jackson	1
St. Charles Medical Center	Bend	2500 NE Neff Rd.	97701	541-382-4321	Deschutes	1
Tuality Community Hospital	Hillsboro	335 SE 8th Ave.	97123	503-681-1111	Washington	1
Tuality Forest Grove Hospital	Forest Grove	1809 Maple Street	97116	503-357-1662	Washington	1
VA Roseburg Healthcare Systems	Roseburg	913 NW Garden Valley Blvd	97470	541-440-1000	Douglas	4
VA Medical Center	Portland	3710 SW US Veterans Hospital Rd	97207	503-220-8262	Multnomah	1
Willamette Falls Hospital	Oregon City	1500 Division	97045	503-656-1631	Clackamas	1

B.   RURAL HEALTH CLINICS

Rural Health Clinics – There are **54 clinics federally designated as Rural Health Clinics** in Oregon. Many of these clinics have limited ability to connect to hospitals or the Internet.

OREGON'S RURAL HEALTH CLINICS								
Organization	Site City	Address	County	Zip	Phone	RUCA	HPSA	MUA
Alsea Rural Health Care	Alsea	201 N 4th	Benton	97324-0229	541-487-7116	2	G	P
Baker Clinic	Baker City	3175 Pocahontas Road	Baker	97814	541-523-4415	7		A
Bayshore Family Medicine	Pacific City	38505 Brooten Road	Tillamook	97135	503-965-6555	10.6		A
Coastal Health Practitioners	Lincoln City	3015 NE West Devils Lake Rd	Lincoln	97367-5131	541-994-5591	7	LI	P
Columbia Hills Family Medicine	The Dalles	1620 East 12th Street	Wasco	97058	541-296-9151	4	MSFW	P
Curry Family Medical	Port Orford	525 Madrona	Curry	97465	541-332-3861	10	LI	A
Dunes Family Health Care	Reedsport	620 Ranch Road	Douglas	97467	541-271-2163	7.4	LI	P
Eastern Oregon Medical Associates	Baker City	3325 Pocahantas Rd.	Baker	97814	541-523-1001	7		A
Elgin Family Health Center	Elgin	1400 Division St	Union	97827	541-347-6321	10.2	G	A
Gifford Medical	Hermiston	1050 W Elm Ave	Umatilla	97838	541-567-2995	4	MSFW	A
Gilliam County Medical Center	Condon	422 N Main	Gilliam	97823-0705	541-384-2061	10	G	A
Good Shepherd Medical Group	Hermiston	600 NW 11th	Umatilla	97838-8602	541-567-5305	4	MSFW	A
Grant County Health Department	John Day	528 East Main	Grant	97845	541-575-0429	10	G	
High Desert Health Care	Prineville	1251 Elm St	Crook	97754	541-4471680	4	LI	
Internal Medicine Group 1810	The Dalles	1810 E 19th St.	Wasco	97058	541-296-1151	4	MSFW	P
Internal Medicine Group 1815	The Dalles	1815 E 19th St.	Wasco	97058	541-296-1151	4	MSFW	P
Internal Medicine Group 1825	The Dalles	1825 E 19th St.	Wasco	97058	541-296-1151	4	MSFW	P
Irrigon Medical Center	Irrigon	220 N Main St.	Morrow	97844-0789	541-922-5880	7.4	G	A
John J. Herscher, D.O.	Oakridge	47815 Hwy 58	Lane	97463	541-782-5800	7.3	LI	
Jordan Valley Health Clinic, Inc.	Jordan Valley	400 Iowa St.	Malheur	97910-0110	541-586-2422	10	LI	A
LaPine Community Clinic	La Pine	50792 Huntington	Deschutes	97739-9639	541-536-3435	2	G	P
Lincoln City Medical Center	Lincoln City	2870 W Devils Lake Rd	Lincoln	97367	541-994-9191	7	LI	P
Lisa Callahan CPNP	Grants Pass	1465 NE 7th St, Ste B	Josephine	97526	541-471-0100	4.2		A
Madras Medical Group	Madras	76 NE 12th	Jefferson	97741	541-475-3874	7	LI	P
Malheur Memorial Health Center	Nyssa	410 Main St	Malheur	97913-0226	541-372-3809	7.2	LI	
Malheur River Clinic	Ontario	2449 SW 4th Ave	Malheur	97914	541-889-1988	4		
McKenzie River Clinic	Blue River	51730 Dexter St.	Lane	97413-0183	541-822-3341	2	G	
Moro Medical Center	Moro	110 Main St.	Sherman	970391	541-565-3325	10.5	G	A
Mt. Angel Family Medicine	Mount Angel	690 N Main St	Marion	97362	503-845-2000	4.2	MSFW	A
North Bend Medical Center-Gold Beach	Gold Beach	94180 Second St	Curry	97444	541-247-7047	10		A

Organization	Site City	Address	County	Zip	Phone	RUCA	HPSA	MUA
North Lake Clinic	Christmas Valley	87480 Spruce Street	Lake	97641	541-576-2343	5		
Oak Street Health Care Center	Brookings	446 Oak Street	Curry	97415	541-412-8898	4	LI	A
OHSU Family Medicine at Scappoose	Scappoose	51377 Old Portland Rd	Columbia	97056	503-418-4226	4.1	G	
Peace Health Cottage Grove	Cottage Grove	1515 Village Ave	Lane	97424	541-942-6555	2		
Pioneer Memorial Clinic	Heppner	130 Thompson Ave	Morrow	97836	541-676-9025	10	G	
Powers Clinic	Powers	140 Poplar	Coos	97466-0040	541-439-7884	10.5	LI	A
Providence Family Medicine Vernonia	Vernonia	510 Bridge	Columbia	97064-1218	503-429-9191	2	G	A
Providence North Coast Clinic	Seaside	727 S Wahanna Rd	Clatsop	97138	503-717-7000	7.4		A
Rogue River Clinic	Rogue River	216 E Main St.	Jackson	97537	541-582-8899	4.2	LI	P
Samaritan Coastal Clinic	Lincoln City	825 NW Hwy 101	Lincoln	97367	541-996-7480	7	LI	P
Shady Cove Clinic	Shady Cove	21990 Hwy 62	Jackson	97539	541-878-2022	2	LI	A
Siskiyou Pediatric Clinic, LLP	Grants Pass	700 SW Ramsey	Josephine	97527-5792	541-955-5683	4.2		A
Strawberry Wilderness Community Clinic	John Day	180 Ford Rd	Grant	97845	541-575-0404	10	G	
The Dalles Family Practice	The Dalles	1730 E 12th St.	Wasco	97058	541-296-5411	4	MSFW	P
The Lakeside Clinic	Dexter	38843 Dexter Rd	Lane	97431	541-937-2134	2		
The Rinehart Clinic	Wheeler	230 Rowe St	Tillamook	97147	503-368-5182	10.3	G	A
The Village Clinic	Klamath	218 Chocktoot St.	Chiloquin	97624	541-783-7900	10.5		
Tillamook Medical Associates, PC	Tillamook	980 3rd St, Ste 200	Tillamook	97141-9469	503-842-5546	7	LI	A
Union Family Health Center	Union	142 E Dearborn St.	Union	97883	541-562-6062	5		A
Urgent Health Care Center	Hermiston	236 E Newport Ave	Umatilla	97838	541-567-1137	4	MSFW	A
Valley Medical Clinic	Baker City	3820 17th St.	Baker	97814	541-523-4465	7		A
Wellspring Family Practice	Grants Pass	1716 Williams Highway	Josephine	97527	541-474-6053	4.2		A
Woodburn Family Medicine	Woodburn	1390 Meridian Dr.	Marion	97071	503-982-2174	2	MSFW	A
Woodburn Internal Medicine	Woodburn	976 Cascade Dr.	Marion	97071	503-982-0403	2	MSFW	A
Yachats Community Clinic	Yachats	114 Hwy101	Lincoln	97498	541-547-3301	10.6		A

C. FEDERALLY QUALIFIED HEALTH CENTERS

Federal Qualified Health Centers – There are **141 FQHC's in Oregon** of which **49 are rural.** The R or U in the "site" column indicates whether rural or urban.

Organization	FQHC	Site	Clinic Sites	Address	Town, Zip	Phone Number	RUCA
Asher Community Health Center	R	R	Asher	PO Box 307, 712 Jay Street	Fossil, OR 97830	541-763-2725	10
Asher Community Health Center		R	Asher Clinic - Spray Field Clinic	601 Willow St.	Spray, OR 97874		10
Benton County Health Department	R	R	Benton Co. Health Department	530 NW 27th St.	Corvallis, OR 97330	541-766-6835	1
Benton County Health Department		R	Lincoln Health Center (SBHC)	121 SE Viewmont Ave.	Corvallis, OR 97333		1
Benton County Health Department		R	Monroe Health Center (SBHC)	610 Dragon Drive	Monroe, OR 97456		2
Central City Concern	U	U	PAHC North	727 West Burnside St.	Portland, OR 97209	503-294-1681	1
Central City Concern		U	Hooper	20 NE Martin Luther King Jr Blvd	Portland OR 97232		1
Central City Concern		U	Cascadia	412 SW 12th Ave	Portland OR 97205		1
Central City Concern		U	Owings Ctr	2545 NE Flanders St	Portland OR 97232		1
Central City Concern		U	Estate Building	225 NW Couch St.	Portland OR 97209		1
Central City Concern		U	Biltmore Building	523 NW Everett	Portland OR 97209		1
Central City Concern		U	PAHC South	726 West Burnside St.	Portland OR 97209		1
Central City Concern		U	Mobile Van	20 NE Martin Luther King Jr Blvd	Portland OR 97232		1
Clackamas County Health Services	R	R	Molalla HC	218 Center Ave.	Molalla, OR 97038	503-655-8471	2
Clackamas County Health Services		U	Oregon City HC	1425 Beavercreek Rd.	Oregon City, OR 97045		1
Clackamas County Health Services		R	Sandy Health Clinic	38872 Proctor Blvd.	Sandy, OR 97055		2
Coastal Family Health Center	R	R	Coastal Family	2055 Exchange Street, Suite 210	Astoria, OR 97103	503-325-8315	4
Columbia River Community Health Services	R	R	Boardman HC		Boardman, OR 97818	541-481-7212	7.4
Community Health Center Inc.	U	U	Ashland	99 Central Ave.	Ashland, OR 97520		1
Community Health Center Inc.		U	Medford	19 Mrytle Street	Medford, OR 97504	541-773-3863	1
Community Health Center Inc.		U	White City	8385 Division Road	White City, OR 97503		1
Klamath Health Partnership	R	R	Klamath HC	2074 South Sixth St	Klamath Falls, OR 97601	541-851-8110	4
Klamath Health Partnership		R	Sprague Valley Medical Center	19140 Edler	Bly, OR 97622		10.2
La Clinica del Cariño	R	R	LCDC HC	849 Pacific Ave	Hood River, OR 97031	541-386-6380	4
La Clinica del Cariño		R	The Dalles Clinic	425 East Seventh	The Dalles, OR 97058		4
La Clinica del Cariño		R	Providence/HR Memorial Hosp.	811 13th St.	Hood River, OR 97031		4
La Clinica del Cariño		R	OR Child Dev. / Migrant Head S.	OCDC/MHS Locations (various)	The Dalles, OR 97058		4
La Clinica del Cariño		R	Home Health Visits	[Mobile]	HR and The Dalles, 97031		4
La Clinica del Valle	U	U	LCDV HC	3617 S Pacific Highway	Medford OR 97501	541-535-6239	1
La Clinica del Valle		U	West Medford	1307 West Main St	Medford OR 97501		1
La Clinica del Valle		U	KHC - Jackson	630 W. Jackson St	Medford OR 97501		1
La Clinica del Valle		U	KHC - Washington	610 S Peach St	Medford OR 97501		1
La Clinica del Valle		U	KHC - Oak Grove	2838 Jacksonville Hwy.	Medford OR 97501		1
La Clinica del Valle		U	KHC - Phoenix	215 N. Rose	Phoenix, OR 97535		1
Community Health Centers of Lane County	U	U	Springfield SBHC	875 7th St.	Springfield OR 97477	541-682-3550	1
Community Health Centers of Lane County		U	Safe and Sound MC	941 W 7th Ave.	Eugene, OR 97402		1
Community Health Centers of Lane County		U	Riverstone Clinic	1640 G St.	Springfield OR 97477		1
Community Health Centers of Lane County		U	Safe and Sound at Opportunity	4311 Willamette St. # B	Eugene, OR 97405		1
Community Health Centers of Lane County		U	Safe and Sound Churchill	1850 Bailey Hill Rd.	Eugene, OR 97405		1
Lincoln County Health Department			NAP	36 SW Nye St	Newport, OR 97365	541-265-4112	7
Multnomah County Health Department	U	U	HIV Clinical Services	426 SW Stark 6th Floor	Portland, OR 97204	503-988-3816	1
Multnomah County Health Department		U	Portland Alternative Hlth Cntr	727 W. Burnside	Portland, OR 97209		1
Multnomah County Health Department		U	Northeast Health Center	5329 NE Martin Luther King Jr Blvd	Portland, OR 97211		1
Multnomah County Health Department		U	Portland Public Schools (101)	501 N Dixon St.	Portland, OR 97227		1
Multnomah County Health Department		U	Parkrose	11717 NE Shaver	Portland, OR 97220		1
Multnomah County Health Department		U	New Avenues for Youth	812 SW 10th	Portland, OR 97205		1
Multnomah County Health Department		U	St. Francis Dining Hall	330 SE 11th Ave	Portland, OR 97214		1
Multnomah County Health Department		U	Rockwood Neighborhood Access	800 SE 181st	Portland, OR 97233		1
Multnomah County Health Department		U	Binnsmead Middle School	2225 SE 87th Ave	Portland, OR 97216		1
Multnomah County Health Department		U	Portland Early Intervention (10)	2600 SE 71st Ave.	Portland, OR 97206		1
Multnomah County Health Department		U	Southeast Dental	3653 SE 34th Ave	Portland, OR 97202		1
Multnomah County Health Department		U	Mult. Education Service Dist.	11611 NE Ainsworth Cir.	Portland, OR 97220		1
Multnomah County Health Department		U	Old Town Clinic	727 W Burnside	Portland, OR 97209		1
Multnomah County Health Department		U	Mult. Early Childhood Prog. (5)	2022 NW Division St.	Gresham, OR 97030		1
Multnomah County Health Department		U	Taft Hotel Respite	1337 SW Washington	Portland, OR 97205		1
Multnomah County Health Department		R	Migrant Head Start (4)	475 NE Burnside Rd.	Gresham, OR 97030		1
Multnomah County Health Department		R	Metro Child Care	912 NE Kelly Suite 270	Gresham, OR 97030		1

Organization	FQHC	Site	Clinic Sites	Address	Town, Zip	Phone Number	RUCA
Multnomah County Health Department		U	North Portland	9000 N. Lombard	Portland, OR 97203		1
Multnomah County Health Department		U	Eartly Head Start	911 N Skidmore St	Portland, OR 97217		1
Multnomah County Health Department		U	CARES	2800 N. Vancouver Ave.	Portland, OR 97227		1
Multnomah County Health Department		U	Clara Vista Family Resource Ctr.	6706 NE Killingsworth St.	Portland, OR 97218		1
Multnomah County Health Department		U	DCD - Donald E. Long	1401 NE 68th Ave	Portland OR 97213		1
Multnomah County Health Department		U	David Douglas School Dist. (15)	1500 SE 130th Ave.	Portland, OR 97233		1
Multnomah County Health Department		U	Gresham / Barlow SD (18)	1331 NW Eastman Pkwy	Gresham, OR 97030		1
Multnomah County Health Department		R	Reynolds School Dist. (15)	1204 NE 201st St	Fairview, OR 97024		1
Multnomah County Health Department		R	Corbett School District (5)	35200 E Hist. Columbia River Hwy	Corbett, OR 97019		2
Multnomah County Health Department		U	Gateway Children's Center	10317 E Burnside St.	Portland, OR 97216		1
Multnomah County Health Department		U	Hooper Detox (Sub-Contractor)	20 NE ML King Blvd.	Portland, OR 97232		1
Multnomah County Health Department		U	Westside Health Center	426 Sw Stark 5th Floor	Portland, OR 97204		1
Multnomah County Health Department		U	PPS Head Start (5)	4800 NE 74th Ave.	Portland, OR 97218		1
Multnomah County Health Department		U	East County Health Center	600 NE 8th Ave	Gresham, OR 97030		1
Multnomah County Health Department		U	Cleveland High School SBHC	3400 SE 26th Ave	Portland, OR 97202		1
Multnomah County Health Department		U	Jefferson High School SBHC	5210 N Kerby Ave.	Portland, OR 97217		1
Multnomah County Health Department		U	Marshall High School SBHC	3905 SE 91st Ave	Portland, OR 97266		1
Multnomah County Health Department		U	Roosevelt High School SBHC	6941 N Central St	Portland, OR 97203		1
Multnomah County Health Department		U	Mid-County Health Center	12710 Se Division St	Portland, OR 97236		1
Multnomah County Health Department		R	La Clinca de Buena Salud	6736 NE Killingsworth	Portland, OR 97218		1
Multnomah County Health Department		U	Madison High School SBHC	2735 NE 82nd Ave	Portland, OR 97220		1
Multnomah County Health Department		U	Parkrose High School SBHC	12003 NE Shaver	Portland, OR 97220		1
Multnomah County Health Department		U	Grant High School SBHC	2245 NE 36th Ave	Portland, OR 97212		1
Multnomah County Health Department		U	Lincoln Park Elem. SBHC	13200 Se Lincoln St	Portland, OR 97233		1
Multnomah County Health Department		U	George Middle School SBHC	10000 N Burr Ave	Portland, OR 97203		1
Multnomah County Health Department		U	Portsmouth Middle School SBHC	5103 N Willis Blvd	Portland, OR 97203		1
Multnomah County Health Department		U	Lane Middle School SBHC	7200 SE 60th Ave	Portland, OR 97206		1
Multnomah County Health Department		U	Whitaker Middle School SBHC	5135 NE Columbia Blvd.	Portland, OR 97218		1
Multnomah County Health Department		U	Parkrose School Dist. (6)	10636 NE Prescott St.	Portland, OR 97220		1
Multnomah County Health Department		U	Centennial School Dist. (8)	18135 SE Brooklyn St.	Portland, OR 97236		1
Multnomah County Health Department		U	Albina Head Start (20)	3417 NE 7th Ave.	Portland, OR 97212		1
Multnomah County Health Department		U	Mount Hood Head Start (22)	10100 NE Prescott St.	Portland, OR 97220		1
Multnomah County Health Department		U	Multnomah County DCHS (5)	421 SW Oak Ave.	Portland, OR 97204		1
Multnomah County Health Department		U	Central Parole and Probation	421 SW 5th Ave.	Portland, OR 97204		1
Multnomah County Health Department		U	PPS ECEC (8)	531 SE 14th Ave.	Portland, OR 97214		1
Multnomah County Health Department			New Access Point		Portland, OR		
Native American Rehabilitation Association	U	U	NARA HC	1776 SW Madison St.	Portland OR 97205	503-274-4251	1
Native American Rehabilitation Association		U	Health Clinic	15 N Morris	Portland OR 97227		1
Native American Rehabilitation Association		U	Residential on St. Helens	17645 NW Saint Helens Highway	Portland OR 97231		2
Native American Rehabilitation Association		U	Outpatient Treatment	1631 SW Columbia	Portland OR 97201		1
Northwest Human Services	U	U	West Salem Clinic (Medical)	150 Kingwood Ave NW	Salem OR 97304	503-588-5828	1
Northwest Human Services		U	Homeless Outreach and Advoc.	694 Church St NE	Salem OR 97301		1
Northwest Human Services		U	West Salem Dental Clinic	190 Kingwood Ave NW	Salem OR 97304		1
Northwest Human Services		U	Mental Health NW	1245 Edgewater Street NW	Salem OR 97304		1
Northwest Human Services		U	Connection	1245 Edgewater Street NW	Salem OR 97304		1
Northwest Human Services		U	HOST Youth and Family Prgrm.	1143 Liberty St. NE	Salem OR 97301		1
Northwest Human Services		U	Total Health Community Clinic	180 Atwater St. N	Monmouth OR 97361		4.2
Ochoco Community Clinic	R	R	Community Clinic (Prineville)	980 N Main ST	Prineville, OR 97754	541-447-0707	4
Ochoco Community Clinic		R	Community Clinic (Madras)	715 SW 4th St Suite C	Madras, OR 97741		7
Ochoco Community Clinic		R	Crook County Jail	400 E. 3rd St.	Prineville, OR 97754		4
Ochoco Community Clinic		U	Bend NAP		Bend, OR		
Outside In	U	U	Outside In	1132 SW 13th St	Portland, OR 97205	503-535-3800	1
Siskiyou Community Health Center	R	R	Grants Pass	125 SE Manzanita Ave.	Grants Pass, OR 97526	541-471-3455	4.2
Siskiyou Community Health Center		R	Project Baby Check	216 Caves Ave	Cave Junction, OR 97523		10.5
Siskiyou Community Health Center		R	Lorne Byrne SBHC	101 S Junction Ave	Cave Junction, OR 97523		10.5
Siskiyou Community Health Center		R	Cave Junction	319 Caves Highway	Cave Junction, OR 97523		10.5
Siskiyou Community Health Center		R	Dental Clinic	1215 NE 7th St Ste F	Grants Pass, OR 97526		4.2

Organization	FQHC	Site	Clinic Sites	Address	Town, Zip	Phone Number	RUCA
Siskiyou Community Health Center		R	Wolf Creek Satellite Site	253 Main St	Wolf Creek, OR 97497		5
Siskiyou Community Health Center		R	Evergreen Elementary SBHC	520 West River Street	Cave Junction, OR 97523		10.5
Tillamook County Health Department	R	R	Tillamook HC	801 Pacific Ave	Tillamook, OR 97141	503-842-3900	7
Tillamook County Health Department		R	Rockaway Beach HC	111 South Miller St	Rockaway Beach, OR 97136		10.3
Tillamook County Health Department		R	South County HC	34335 Highway 101 S	Cloverdale, OR 97112		10.6
Umpqua Community Health Center	R	R	Roseburg	544 W Umpqua St. Ste. 206	Roseburg, OR 97470	541-464-2709	4
Umpqua Community Health Center			Drain		Drain, OR 97435		10.4
Umpqua Community Health Center		R	Glide	20170 N Umpqua Hwy	Glide, OR 97443		10.2
Umpqua Community Health Center		R	Roseburg HS Teen Health Center	547 W Chapman Ave.	Roseburg, OR 97470		4
Valley Family Health Care	R	R	Nyssa Medical Clinic	17 S 3rd Street	Nyssa, OR 97913	208-642-9376	7.2
Valley Family Health Care		R	Nyssa Dental Clinic	17 N. 6th Street	Nyssa, OR 97913		7.2
Valley Family Health Care		R	Vale Medical Clinic	789 Washington W	Vale, OR 97918		10.5
Valley Family Health Care		R	Holy Rosary Medical Center	351 SW 9th	Ontario, OR 97914		4
Valley Family Health Care		R	Ontario Medical Clinic	7 SW Third St.	Ontario, OR 97914		4
Valley Family Health Care		R	Ontario Dental Clinic	84 NW 2nd Street	Ontario, OR 97914		4
Virginia Garcia Memorial Health Center	R	R	Cornelius	85 N 12th Ave.	Cornelius, OR 97113	503-359-5564	1
Virginia Garcia Memorial Health Center		R	Cornelius	44 N. 11th Ave	Cornelius, OR 97113		1
Virginia Garcia Memorial Health Center		U	Hillsboro Healthy Start	730 SE Oak St	Hillsboro, OR 97123		1
Virginia Garcia Memorial Health Center		R	McMinnville	1900 N. Hwy 99 W	McMinnville, OR 97128		4.2
Virginia Garcia Memorial Health Center		U	Hillsboro	266 West Main St	Hillsboro, OR 97123		1
Virginia Garcia Memorial Health Center		U	Cornelius	1152 Baseline	Cornelius, OR 97113		1
Virginia Garcia Memorial Health Center		U	Beaverton	2935 SW Cedar Hills Road	Beaverton, OR 97005		1
White Bird Clinic	U	U	White Bird Clinic	341 E 12th Avenue	Eugene, OR 97401	541-342-8255	1
White Bird Clinic		U	Mill Street Clinic	1400 Mill St	Eugene, OR 97401		1
White Bird Clinic		U	Chrysalis	323 E 12th Ave	Eugene, OR 97401		1
Yakima Valley Farm Workers Clinic	R	R	Hermiston	595 Northwest 11th St.	Hermiston, OR 97838	509-865-5896	4
Yakima Valley Farm Workers Clinic		R	Salud Medical Center	1175 Mt. Hood Avenue	Woodburn, OR 97071		2
Yakima Valley Farm Workers Clinic		U	Rosewood Family Health Center	8935 S.E. Powell Blvd.	Portland, OR 97266		1
Yakima Valley Farm Workers Clinic		R	Silverton	214 Oak Street	Silverton, OR 97381		4.2
Yakima Valley Farm Workers Clinic		U	Lancaster Family Health Center	3896 Beverly Avenue NE Building J	Salem, OR 97305		1
# New Clinic Sites since 2002							
Current # Sites							

D.   OREGON COMMUNITY COLLEGES & BRANCH LOCATIONS (4/14/07)

Community Colleges – Key partners in the OHN are Oregon's **17 community colleges** and their branch campuses. All of these colleges deliver coursework in healthcare professions.

1.   **Blue Mountain Community College**
       2411 NW Carden Ave.
       PO Box 100
       Pendleton, OR 97801

              BMCC Baker
              3275 Baker Street
              Baker City, OR 97814

              BMCC Hermiston
              980 SE Columbia Drive
              Hermiston, OR 97838

              BMCC Milton-Freewater
              311 N Columbia
              Milton-Freewater, Or 97862

              BMCC Boardman
              300 NE Front Street
              Boardman, OR 97818

2.   **Central Oregon Community College**
       2600 NW College Way
       Bend, Or 97701

              COCC Redmond Campus
              2030 DE College Loop
              Redmond, OR 97756

3.   **Chemeketa Community College**
       4000 Lancaster Dr. NE
       PO Box 14007
       Salem, OR 97309

              Chemeketa CC Dallas Center
              915 SE Ash
              Dallas, OR 97338

              Chemeketa CC McMinnville Campus
              500 NW Hill Road
              McMinnville, OR 97128

Chemeketa CC Santiam Center
11656 Sublimity Road SE.
Santiam, OR

Chemeketa CC Woodburn Campus
120 East Lincoln Street
Woodburn, OR 97071

4. **Clackamas Community College**
19600 S Molalla Ave.
Oregon City, OR 97045

Clackamas CC Wilsonville Campus
29353 Town Center Loop E
Wilsonville, OR 97070

Clackamas CC Harmony Campus
7616 SE Harmony Road
Milwaukie, OR 97222

5. **Clatsop Community College**
1653 Jerome Ave.
Astoria, OR 97103

Clatsop CC MERTS Campus
South Tongue Point
Astoria, OR 97103

6. **Columbia Gorge Community College**
400 E Scenic Drive
The Dalles, OR 97058

CGCC Hood River Center
Hood River, OR 97058

7. **Klamath Community College**
7390 South Sixth St.
Klamath Falls, OR 97603

8. **Lane Community College**
4000 East 30th Ave.
Eugene, OR 97405

Cottage Grove Center
1275 S. River Road
Cottage Grove, OR 97424

Florence Center
3149 Oak Street
Florence, OR 97439

9.   Linn-Benton Community College
6500 Pacific Blvd. SW
Albany, OR 97321

LBCC Benton Center
757 NW Polk Avenue
Corvallis, OR 97330

LBCC Lebanon Center
44 Industrial Way
Lebanon, OR 97335

LBCC Sweet Home Center
1661 Long St.
Sweet Home, OR 97386

10.   Mt. Hood Community College
332 SE Stark St.
Gresham, OR 97030

Mt. Hood CC Maywood Park Campus
10100 NE Prescott
Portland, OR 97220

Mt. Hood CC Bruning Center for Allied Health
1484 NW Civic Drive
Gresham, OR 97030

11.   Oregon Coast Community College
332 SW Coast Hwy.
Newport, OR 97365

North County Center
1206 SE 48th
Lincoln City, OR 97367

South County Center
1049 SW Pacific Coast Highway
Waldport, OR 97394

12.   Portland Community College
12000 SW 49th Ave.
Portland, OR 97280

PCC Cascade Campus
705 N. Killingsworth St.
Portland, OR 97217

PCC Rock Creek Campus
17705 NW Springville Rd.
Portland, OR 97229

PCC Sylvania Campus
1200 SW 49th Ave.
Portland, OR 97219

13.   Rogue Community College
Redwood Campus
3345 Redwood Highway
Grants Pass, OR 97527

RCC Riverside Campus
227 E. Ninth St.
Medford, OR 97501

RCC Table Rock Campus
7800 Pacific Avenue
White City, OR 97503

14.   Southwestern Oregon Community College
1988 Newmark Ave.
Coos Bay, OR 97420

SWOCC Brookings Campus
420 Alder Street
Brookings, OR 97415

SWOCC Gold Beach Campus
29392 Ellensburg
Gold Beach, OR 97444

SWOCC Port Orford Campus
1403 Ocean Drive
Port Orford, OR 97450

15.   **Tillamook Bay Community College**
       2510 First St.
       Tillamook, OR 97141

16.   **Treasure Valley Community College**
       650 College Blvd.
       Ontario, OR 97914

17.   **Umpqua Community College**
       1140 College Road
       PO Box 967
       Roseburg, OR 97470

VII.   COORDINATION: STATE AND REGIONALLY

Telehealth Applications: Building statewide collaboration

While a great deal of thought has gone into the technical design and plan for the OHN infrastructure, the OHN leadership is mindful that the success of any network depends on the success of the applications it enables. The OHN has been conceptualized as a statewide collaboration, uniting the individual extensive efforts of a core constituency to include healthcare, health education, public health, and emergency management into a cohesive enterprise toward the seamless delivery of health related applications and services. To fully appreciate the collaboration that has catalyzed the development of the OHN, and that will galvanize its combined efforts into a cohesive ongoing operation, it is important to know the impressive work that is already underway, and upon which the OHN is both founded and propelled forward. The following sections provide a discussion of the applications that are in process relative to our core constituents: Telemedicine, health education, and emergency management applications. The substantial efforts described below serve as building blocks upon which the OHN statewide collaboration is founded. The statewide collaboration will embrace and extend the many regional collaborative efforts that have already taken place in Oregon within the regional health networks that will be joined together in the Oregon Health Network.

Telemedicine Applications

Telemedicine epitomizes the health delivery system of the future. While a robust, secure infrastructure serves as foundation, it is the actual applications supported by this network that will enable point-of-care decision making across a multi-entity system; present a holistic picture of the patient; provide timely, accurate and complete medical data when and where it is needed; enable collaborative diagnosis and treatment strategies; all while safeguarding best practice solutions at each decision juncture.

A great deal of independent telemedicine activity is already taking place across Oregon on a point-to-point or regional basis. The first telemedicine applications to run over the Oregon Health Network (OHN) will be applications currently using other means that will migrate to OHN because of improved speed or quality or because of lower cost. OHN is designed to meet the needs of current applications and solve problems that are apparent in the existing arrangements. Once users are familiar with the new network and understand and are confident in its capabilities, new applications will be added.

Telemedicine is "the use of telecommunications technology to deliver clinical diagnosis, services and patient consultation." Applications can be real-time or store-and-forward. The benefits of being able to deliver telemedicine services are becoming well documented and better understood, and include the following:

- **Advancements in delivery of services**
  Health services can be greatly enhanced via telemedicine. For example, home health services are receiving a great deal of attention and investment in some states. Telemedicine technologies enable home health providers to redefine patient treatment plans, as they are able to increase patient visits due to elimination of a significant percentage of travel to patients' homes. Rural patients can now have access to specialists.

- **Keeps dollars in the local economy**
  Telemedicine helps provide service locally so people don't have to travel out of the community for care. Spending on health care is an especially significant portion of any economy, especially rural economies. The more of those dollars that can be kept locally the better off the local economy will be. Standard economic multiplier effects also apply here—any money spent locally ripples through the local economy.

- **Aids business recruitment and retention**
  Telemedicine provides the capability to deliver clinical services in the community. Locally available quality health care and quality schools are two important factors in the recruitment of new businesses, especially for businesses in rural communities. So there is a potential business recruitment and retention factor to consider.

Additionally, from the patient's perspective, access to telemedicine services provides the following advantages:

- **Access to healthcare**
  Access to quality, state of the art health care in underserved areas, such as rural communities, is one of the most important promised benefits of telemedicine. Rural residents are not second-class citizens; they deserve access to health care services that those in metropolitan areas enjoy. Over 55 million people (20% of the U.S. population) reside in rural America and having local quality health care is important to them.

- **Saves time, travel, and other expenses**
  Telemedicine entails moving from a service delivery system in which patients (and often parent or guardian) physically travel from a rural area where they reside to an urban area to consult with a medical specialist, to a system in which the specialist consults with the patient and rural primary care provider using telecommunications facilities. An obvious opportunity is the potential for transportation cost savings, such as the potential for saving a portion of the millions spent annually on patient automobile travel expenses, emergency air evacuations or other forms of transporting patients across the large expanses of rural America.

- **Healthcare at home**
  Home care and community based health services are becoming an increasingly important part of the healthcare service continuum. There are many reasons for this including: patients are leaving hospital sooner and need some additional care at home while they recover, treating patients at home is less expensive than treating them in the hospital, many patients prefer to stay in their homes as long as possible before moving onto a higher level of healthcare service, such as a nursing home or hospice. A research project found that telehome care allowed home care nurses to "see" more patients in a day, decreased the visit time and ended up costing 33-50% less than the traditional home care visit.

- **Health provider integration**
  Improved collaboration between providers (for example, shared access to electronic medical records and provider to provider consultations) provides patients with enhanced confidence that all that can be done is being done.

The OHN will take deliberate steps to build upon what already exists. Many hospitals and health systems in Oregon are either planning or currently providing telemedicine services to rural and underserved areas. Examples of these services are:

Transfer of digital pediatric echocardiogram images: Oregon Health and Science University (OHSU), Oregon's only academic medical center, currently has Virtual Private Networks (VPN's) set up with PeaceHealth (Eugene), Samaritan Health Services (Corvallis), and Southwest Washington Medical Center so that those health systems can send digital pediatric echocardiogram images for interpretation. These images are currently flowing across the public Internet and can take 30 to 40 minutes to arrive. While this is still more efficient than receiving a compact disk through the mail, or by courier, it is still not ideal, particularly when a very sick child is involved. Creating more direct, higher bandwidth connections between OHSU and these other health systems would support more immediate, higher quality patient care. Other Oregon health systems with possible interest in participating in this application include Asante Medical Center (Medford), St. Charles Medical Center (Bend), Bay Memorial Hospital (Coos Bay), and Mercy Medical Center (Roseburg).

Transfer of or remote access to other digital radiology images: Many of Oregon's health systems provide remote access to radiology images allowing clinicians to consult with other providers and provide patient diagnosis from their clinic offices or their homes. Additionally, secondary or tertiary hospitals like OHSU also receive digital radiology images from health systems and/or hospitals that transfer patients to them. Before creating network connections, these images were sometimes received on compact disks or tapes that often proved to be difficult to read, or were not received at all, which resulted in duplicate tests for the patients. When images are sent digitally across a more direct high-speed connection, it is more likely that the image will be received and viewed by the physicians at the receiving hospital upon (or before) the patient's arrival, thus supporting more immediate patient care.

Telegenetics clinics: OHSU's Child Development and Rehabilitation Center (CDRC) group currently has a Health Resources and Services Administration (HRSA) grant that includes funding for the provision of telegenetics clinics in Oregon and Idaho. OHSU geneticists, dieticians, and genetics counselors can now, through video conferencing technologies, see patients remotely in Medford (Rogue Valley Medical Center), Bend (Public Health Building), and Boise, Idaho (St. Luke's Medical Center). OHSU uses encryption software through the video units across the public Internet. OHSU has experienced quality of service issues (jitter, delays, and dropped calls) that could be alleviated by more direct connections through a network like OHN.

Telepsychiatry: OHSU is currently doing two telemedicine clinics a week with Three Rivers Prison in Pendleton. OHSU psychiatrists have a room at OHSU that they use to "see" patients at Three Rivers using encrypted video conferencing. A dedicated T-1 line between the prison and OHSU was required to ensure the quality of service necessary. This carries a cost of approximately $30,000 per year, which is ultimately unsustainable, and prevents expansion of this program to other prisons. Additionally, OHSU's Child Psychiatry Department is providing remote child psychiatry clinics in partnership with Greater Oregon Behavioral Health, Inc. (GOBHI), a private, not-for-profit managed behavioral care company in Oregon, which was started in 1994, and contracts with the state for Medicaid-covered lives in rural and semi-urban counties. Encrypted video conferencing technology is used to connect to mental health clinics in rural Oregon, but because of inadequate bandwidth and quality of service issues, the program is not fully utilized. A State of Oregon connection to OHN could provide the bandwidth and quality of service that would make this program as well as the prison telepsychiatry program more cost effective and sustainable.

Remote Pediatric Intensive Care Unit (PICU) consults: OHSU has begun a pilot program where PICU physicians are consulting on and "seeing" critically ill children at Sacred Heart Medical Center in

Eugene, using encrypted video conferencing over the public internet. Initial testing has been positive, but using the public Internet risks quality of service issues, and, if this occurs at a critical point in the consult, it could impact patient care. The fall back position is a phone consult, but this would likely result in the patient being transported to OHSU. With adequate quality of service to ensure a good video connection, the patients may be able to stay in their home community and hospital.

Remote Adult ICU consults: OHSU is exploring the possibility of providing adult ICU consults, much like the PICU pilot program. More direct, high-speed connections are highly desirable to ensure the success of this program.

Remote Surgery consults: OHSU is beginning to explore the possibility of providing remote surgery consults and education. This could include the actual monitoring of laparoscopic and other surgeries, as well as continuing education for physicians in our rural areas. A guaranteed quality of service that is not available on the public Internet is essential for such a program to ensure appropriate quality of care for the patient.

Medical Informatics: The Department of Medical Informatics & Clinical Epidemiology (DMICE) is an academic unit in the OHSU School of Medicine devoted to research and education in the respective disciplines of biomedical informatics and clinical epidemiology. OHSU's biomedical informatics program is world-renowned for its accomplishments in both research and education. Not content to be an "ivory tower" academic program, however, DMICE has undertaken a wide variety of activities that aim to reach out to the local, national, and international communities. Its research collaborators and students come from all over the world. DMICE is planning the development of a center devoted to academia-industry collaboration, with a special focus on economic development for health/biomedical information technology in Oregon.

Most OHSU informatics education programs are also available via distance learning. We have been successfully offering most of our courses and programs on-line since 1999. Our program has evolved to the point where on-line and on-campus offerings are considered equivalent and not distinguished on a student's transcript. Distance learning does not mean "distant" learning. We have standardized on a number of technologies that provide high-quality and interactive education. Our courses are not correspondence courses, and require a sustained commitment of one's time for success. Almost all of the course activities are, however, asynchronous, meaning that students can access the material on their schedule as long as they keep up with the overall class.

Remote Home Healthcare: Asante Health Systems will be deploying 50 monitors in Jackson and Josephine Counties this year through two home health programs located in Grants Pass and Josephine County. Asante hopes to provide telemonitoring services to 525 homecare patients during the first year of operation. The system allows a patients weight, blood pressure, heart rate, Sp02, temperature, blood glucose levels and lung capacity to be measured by the patient or the caregiver in the home and transmitted to a telemonitoring nurse at the home health program. The data is presented so that the nurse can see if it is outside acceptable parameters and if further intervention is needed. The system also allows the nurse to ask the patients daily questions about their activities, eating habits, and problems they may be experiencing. National evaluations of these programs have shown that using these systems improves patient function, and reduces hospital admission and emergent care visits.

Electronic Health Records (EHR). Dr. Jody Pettit, working in the Office of the Governor, is leading a statewide Oregon effort to achieve interoperable electronic health records throughout the Oregon healthcare system. The goal: "To build an electronic health information infrastructure in Oregon such that an individual's health information is available when and where it is needed for their care. The health information should be private, secure and under the control of the individual." A 2006 survey of

approximately 2400 clinics in the state, with a 68% return rate, indicates that Oregon has a 59% rate of adoption of EHR in ambulatory clinics, double the national average of 24%. OCHIN is the electronic health record and information service provider for most of the safety net clinics in Oregon, including county health clinics and other federally qualified health centers. OCHIN began as the Oregon Community Health Information Network, but dropped that name after they expanded out of state and are now known just as OCHIN. The state plan for interoperable electronic health records includes support for bringing high-speed electronic connectivity to outlying hospitals and clinics. OHN will provide a secure platform for implementing interoperable electronic health records in Oregon.

Healthcare Education Applications

Oregon has been actively addressing the coming shortage of healthcare workforce across the state, with special attention on the need to provide adequate healthcare providers in the already underserved rural areas of the state.

It is important to understand the numbers around the healthcare workforce shortages predicted for Oregon within the next ten years to fully understand the potential crisis we are facing. In a report on workforce, the Oregon Employment Department reported an expected need for an additional 59,000 healthcare workers by the year 2014.

In addition to the sheer numbers needed, one of the most critical issues in developing an adequate, well-trained healthcare workforce in rural areas is the need to provide professional education to students and opportunities for continuing professional development in the communities where they live.

The benefits are many-faceted: it provides a living wage position to the individual; it ensures that the community has adequate health care services provided by well-educated professionals; and it expands the economic viability of local communities and the entire state as well.

A critical component to enable us to provide the education and continuing professional development is the ability to telecommunications to use high-quality videoconferencing, web-based programs and other emerging electronic technologies.

Several Oregon reports recognize the critical role that telecommunications. In 2003, the Oregon Legislature directed the Oregon Telecommunications Coordinating Council to develop a plan to "ensure that the education and health care communities are able to connect by broadband and other telecommunications infrastructures necessary for distance learning" and to report their findings to the subsequent 2005 Legislature.

A second major report was produced in 2006 by the Community College Healthcare Action Plan (CCHAP) and Portland Community College under a grant from the Department of Commerce. Both reports highlighted the importance of the adequacy of telecommunications to promote education for development of healthcare workforce in rural areas.

Oregon's community colleges and the university system have recognized the need to address rural health provider shortages. They are currently using, as well as actively developing and expanding their ability to use telecommunications and distance technologies to provide healthcare professional education. Both reports mentioned above identified that many times their ideas and ability to provide programs in this manner are hampered by the lack of adequate telecommunications services to their institutions and students, especially in rural areas.

There are several noteworthy projects and collaborations currently designed to address the need for

healthcare providers that envision the use of telecommunications technologies. These innovative programs will need adequate and appropriate telecommunications technologies and services to be successful.

Possibly the most ambitious of these is the Oregon Consortium for Nursing Education (OCNE). OCNE has developed a nursing curriculum to be used statewide through the community colleges and the higher education nursing program at Oregon Health & Science University. The Consortium envisions using various types of distance education to expand the capacity of the nursing programs. One of the ways this will be done will be to allow the limited nursing faculty around the state to provide coursework to students, not just in their own institutions but also around the state. In addition, the junior and senior years of the curriculum will be delivered via distance technologies from OHSU to the participating community colleges all across the state. For the first time, this will enable students in rural locations to complete a Bachelor's program in nursing without ever leaving their home community.

Many other programs have been or are being developed using distance technology for health care programs. Notable among them are the programs being offered in collaboration by the Oregon Institute of Technology (OIT) with other state universities and community colleges. It is important to understand the geography involved with these collaborations. OIT is a small regional university with a statewide mission. It is located in a comparatively small community in the far south/southeastern section of Oregon. Their collaborations range across the entire state, and generally require the use of distance education. As the designated Center for Health Professions, they are the only institution in the state that provides Bachelor education in health technology professions of all types.

OIT is currently a site for the OHSU Bachelor program for nursing and it is hoped that expansion of that program can be realized through the addition of distance education.

Examples of the OIT collaborations that involve telecommunication technologies in distance education are the following: 1) it is a site for the OHSU Bachelor's degree program for nursing, which they hope can be expanded through the stronger distance education; 2) a Bachelor's program in respiratory care, offered by OIT in collaboration with select community colleges, with potential for adding other community colleges; 3) a Bachelor's program in dental hygiene—one is being offered in collaboration with Eastern Oregon University and another is in the planning stages with a community; and 4) OIT has extensive extern programs for their health technology degrees (such as diagnostic imaging sonography, radiologic technology, clinical laboratory services, vascular technology and echocardiology). During the externships, it would be beneficial to continue education and contact with externs while students are physically located at hospitals all across the state by using a variety of telecommunications technologies.

Another nationally recognized Oregon program to address quality health workforce education is the activities of the Oregon Simulation Alliance (OSA). The OSA mission is to provide leadership in the use of simulation technologies to increase the quality and quantity of Oregon's healthcare workforce. It envisions an efficient statewide network of simulation technology resources, information and training systems.

While use of high-fidelity simulators to train healthcare providers is largely a site-based activity, the OSA, plus educators and healthcare facilities, are beginning to realize the importance of distance education in simulation as well as regular coursework. Due to the use of video to record the simulation, adequate telecommunications capacity will be needed to share simulation videos amongst educational and healthcare institutions.

Emergency Preparedness Applications

Many emergency responders and emergency support providers including hospitals, clinics, private practitioners, public health, EMS, and tribal partners cannot communicate across jurisdictions and disciplines during day-to-day operations and large-scale incidents. Incident response communications across disciplines, jurisdictions, and organizations often break down during emergency response situations and are frequently noted as needing improvement in after action reports.

The inability to relay incident information directly and effectively between and among the personnel on the front line of an emergency incident to the first line of receivers jeopardizes the lives of citizens and the emergency service providers themselves. The issue is complicated by a diverse set of factors, including the political and historical turf battles, assorted technologies in use, and funding shortfalls. Fortunately, expensive technology purchases are not the only solution. Immediate progress can be achieved in many instances with the implementation of standard operating procedures and additional training that are low in cost and high in impact.

Resolving this issue will require sustained attention and action driven by the emergency responders and service providers at the local level. The individuals who are passionate about improving communications and interoperability, those who recognize the need to make progress, and those who will be affected by efforts to improve communications and interoperability need to be included. The first step of establishing a firm foundation upon which to build and improve for the future was completed at the strategic planning session.

OHN will provide a foundation that will provide for situational awareness, information sharing, and incident management coordination that does not exist today. Some of the emergency preparedness applications that will use OHN are summarized below.

Oregon Health Alert Network (HAN). The Oregon Secure Health Network Program is provided by the US Centers for Disease Control and Prevention (CDC). Additional federal funds from the Health Resources and Service Administration (HRSA) contribute to several program activities. The Oregon Secure Health Network is a dynamic web portal comprised of several sophisticated web applications. Its primary purpose is to process, push, and archive health and disease information to the healthcare delivery community and to response partners. Typically, the system is used to share routine environmental health, epidemiological, and laboratory information to the health and medical community. The system also gives Federal, State, and local agencies the ability to rapidly (and securely) push emergency notifications to throughout the state. The Health Network Program is part of the CDC National Health Alert Network System and is a key component of the Public Health Information Network (PHIN)[21]. It is an effort to improve public health among state and local public health agencies, hospitals, labs, and tribes in Oregon as well as neighboring public health partners in California, Washington, and Nevada. Components include:

- Health Information Systems Capacity
- Environmental Health / Epidemiological information processing and messaging
- Communications Systems - Rapid, Secure, web-based
- Partner Communication
- Outbreak/Communicable Disease Reporting and Information
- Disaster Preparedness Radio Systems

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[21] http://www.cdc.gov/PHIN/

- Emergency Operations Center Technical Support
- PHIN Countermeasure and Response Administration - which includes technical oversight of SNS, Strategic National Stockpile distribution (should it be deployed in Oregon) and the use of OpsCenter within the Healthcare Delivery System.
- Integration of all PHIN Cross Functional Components (CFC), including: Outbreak Management, Connecting Lab Information Systems, Early Event Detection, and the Immunization Program in the Office of Family Health.
- Healthcare Volunteer Registries - State and Local Medical Reserve Corps (ESAR-VHP)
- Hospital Preparedness and supplies tracking / census reporting

HOSCAP – Hospital Capacity\Incident Management. The Hospital Capacity Web Site exists so that hospitals and emergency coordinators in the state can share essential information. This includes information about the number of beds available, the status of emergency departments and the types and amounts of supplies on hand at regional hospitals. In addition, the site provides announcements, contact information for hospitals and disaster planning centers and up-to-date information regarding incidents that affect regional emergency departments. All hospitals in the state have access to this site and each hospital updates its status information on a regular basis.

Ops Center – Incident Management and Situational Awareness. Ops Center is driven by status boards for Incident Management and Situational Awareness and has been selected by Oregon Emergency Management and Oregon Public Health as the tool for the State of Oregon to manage emergencies. An example of a status board is the Organizations board which shows not only what organizations are available for the response effort, but also explains their capabilities, cost, location and readiness status. In the midst of a critical situation, may different people may be working on the same activities in the same roles and Ops Center allows for multiple users to participate in the management approach. Procedures and checklists provide a positive way to verify that certain recommended or required actions have been taken and done in a certain order. They also provide a level of help in dealing with unusual circumstances. Every time a user logs into OpsCenter, they enter where they are currently located and how to get in touch with them. This information can be accessed via OpsCenter's staffing report. This report lists all users that have been registered with OpsCenter and what roles they are authorized to perform. It also tells who is currently on the system, what role(s) they are performing, what role(s) they are authorized to perform, and how to contact them. During an emergency, a vast amount of information is gathered regarding facilities, equipment, missions, supplies, and personnel. Both during and after an emergency, this information must be placed into reports and disseminated both inside and outside the company or organization. Op Center provides real time tracking of both human and material resources and crosses jurisdictional and organizational boundaries allowing multiple entities to share information in time for it to matter.

ESAR-VHP – Emergency Service for the Advanced Registration of Volunteer Health Professionals. Recent events, including the terrorist attacks of September 11, 2001, and the anthrax attacks that immediately followed, increased the national attention given to public health emergency preparedness. These events underscored the need for an emergency "surge" or supplemental health care workforce that can be mobilized to respond immediately to a mass casualty event. The experiences of New York City hospitals in the aftermath of the World Trade Center destruction were instructive about the issues confronting the use of health care professional volunteers in an emergency or mass casualty event. According to reports, hospital administrators involved in responding to the World Trade Center tragedy reported that they were unable to use medical volunteers when they were unable to verify the volunteer's basic identity, licensing, credentials (training, skills, and competencies), and employment. In effect, this precious, needed health workforce surge capacity could not be used.

Congress recognized the need to make optimum use of volunteer health personnel in an emergency and

authorized the development of an Emergency System for Advance Registration of Health Professions Volunteers (Public Law (PL) 107-188, the *Public Health Security and Bioterrorism Preparedness and Response Act of 2002*, Section 107). HRSA was delegated the responsibility for carrying out this legislation and is assisting each State (and Territory) in establishing a standardized, volunteer registration system. Each state-based system will include readily available, verifiable, up-to-date information regarding the volunteer's identity, licensing, credentialing, accreditation, and privileging in hospitals or other medical facilities. The establishment of these standardized State systems will give each State the ability to quickly identify and better utilize health professional volunteers in emergencies and disasters. In addition, these State systems will, ultimately, enable the sharing of these pre-registered and credentialed health care professionals across State lines and even nationally.

The goal is to assist grant awardees of HRSA's cooperative agreements in establishing a pre-registration system for emergency volunteer health professionals. This system of State based systems will, when complete, form a National system that will allow efficient utilization of health professional volunteers in emergencies by providing verifiable, up-to-date information regarding the volunteer's identity and credentials to hospitals or other medical facilities in need of the volunteer's services. Each State's system will be built to standards that will allow quick and easy exchange of health professionals with other States, thereby maximizing the size of the population able to receive services during a time of a declared emergency.

As described above, Oregon has many initiatives underway within and among its core constituencies that will be brought together into a collaborative OHN plan for a cohesive health network strategy to serve all Oregon residents and enable them to be a part of a national health network enterprise. This is not just a statewide collaboration to create and operate a health network. It is a statewide collaboration to ensure that the network will be used to improve the health of Oregonians. The mechanisms by which this collaboration will take place are described in the project management plan in Section VIII, above.

VIII. PROJECT MANAGEMENT PLAN

Business Overview

The Oregon Health Network (OHN) will provide access to a statewide telecommunications network to interconnect Oregon hospitals, clinics, county public health offices, physicians, mental health, dental and optical clinics, health education institutions and others in an affordable, seamless web that will enable a full range of available telehealth services to be delivered in all of Oregon's rural areas and throughout the state.

OHN will be interoperable with Oregon public safety networks for coordination of disaster planning and response, and will interconnect with the Internet and Internet2/National Lambda Rail in order to reach all relevant sites on those networks. This network will also provide connections for health insurers with secure payment mechanisms and to pharmacies with secure electronic prescribing applications.

The OHN will save travel costs by enabling multi-site videoconferencing. It will enable reliable data, voice, and video transmission of sufficient quality for real time medical consultation, home health monitoring, and clinical instruction. The OHN will also provide a network suitable for secure exchange of electronic medical records among those authorized to send and receive them.

The business commitment of the OHN is to provide this interconnection to end users at the most economical rate and to assure that the quality and reliability of the network is state of the art, while remaining sufficiently flexible to grow with evolving telecommunications standards and services. Further, OHN intends to create a sustainable statewide health network that builds upon existing regional broadband network infrastructure, with the ultimate goal of participating in development of a national health network that serves the healthcare needs of all U.S. citizens.

Oregon is renowned for its unique culture, which can perhaps best be described as dichotomous: it fosters both autonomy of thought and coalescence of enterprise. The OHN serves as example in that it is the culmination of a planning process that melds together the autonomous agendas of a diverse, multivariate group of organizations and individuals into a coalescent telehealth enterprise: the OHN. The Telehealth Alliance of Oregon organized meetings of all Oregon stakeholders with an interest in improving the telecommunications infrastructure in Oregon to better serve the health care needs of the state. More than 150 organizations and individuals brought forward their individual and collaborative efforts, and through a series of meetings and/or e-mail activities, have framed the OHN through a statewide consensus building process. The OHN evolutionary process includes stakeholders from the following domains: health, education, emergency management, public health, rural agencies, economic development, pharmacy, telehealth/distance learning, funding agencies, payers, telecommunications service providers and other vendors as well as state and federal policy makers. Table 1 below represents the diverse groups who chose to participate in the OHN planning process.

Table 1: OHN Planning Stakeholders

Name	Organization
Andrews, Larry	Quantum Communication
Arbogast, Nate	Inland Development
Ashdon, Deborah	Merle West Medical Center
Awbrey, Glenna	Alliec Health Education Center (AHEC) of Southwest Oregon
Bain, Shelley	State Insurance Division
Baker, Cindy	Providence Health System
Behm, Dennis	Sparling
Bell, Jo	Telehealth Alliance of Oregon Board of Directors
Bell, Nancy	Samaritan Health Systems
Berrian, Pam	Oregon Telecommunications Coordinating Council (ORTCC)
Betlinski, Jon	Oregon Health & Science University (OHSU
Bishop, Jim	Harney District Hospital
Blake, Ann	Cascade Healthcare Community
Blanc, Larry	St. Anthony Hospital
Box, Agnes	Oregon Institute of Technology
Britain, Cathy	Telehealth Alliance of Oregon Board, Asante Health System
Bundy, Larry	Blue Mountain Community College
Burton, Bob	Qwest
Butler, Jeanette	Ashland Hospital
Cable, Andrea	Central Oregon IPA
Carlson, James	Oregon Health Care Association
Cooley, Doug	CenturyTel
DeSocio, John	Oregon Health & Science University (OHSU)
Dolan, Jon	Oregon State University
Duehmig, Bob	Office of Rural Health
Dunn, John	Oregon Health & Science University (OHSU)
Durrett, Gayland	Asante Health System - ITS
Easton, Andi	Oregon Association of Hospitals and Health Systems (OAHHS)
Edvalson, Terry	Pendleton Academies
Ellenby, Miles	Oregon Health & Science University (OHSU)
Ericksen, Dan	Oregon Telecommunications Coordinating Council (ORTCC)
Falkowski, Judy	Bay Area Hospital Home Health Agency
Fickle, Marvin	Oregon State Psychiatric Center
Finklein, Terry	Columbia Memorial Hospital
Fischer, Dave	Department of Human Services-PHD-HPCDE
Fontanilla, Julie	West Valley Hospital
Frey, Susan	Yellowhawk Tribal Health Center
Gibson, Dick	Providence Health System
Giesking, Ruth	Providea Solutions, Inc
Goldberg, David	Oregon Healthcare Workforce Institute
Goldrick, Robert	Coquille Tribe Community Health Clinic
Grunberg, Keith	Charter Communications
Hancock, Carolyn	State Insurance Division
Hansen, Leif	LS Networks
Hayward, Missy	Wallowa County Health Care District
Hendrickson, Alan	Providence Health System
Hersh, Bill	Oregon Health & Science University (OHSU)
Herz, William	

Name	Organization
Hetz, Mark	Asante Health System
Hoffman, Kim	Telehealth Alliance of Oregon Health Board, OHSU
Howe, Judy	Cascade Health Solutions
Husing, Onno	Oregon Telecommunications Coordinating Council (ORTCC)
Irwin, John	TAO board, ORTCC chair, Southwest Oregon AHEC board
Jensen, Ed	Wallowa ESD
Jorgenson, Dennis	State Data Center
Kemper, Lynn	Acumentra Health
Knight-Richardson, Norwood	Oregon Health & Science University (OHSU)
Koczur, Alexander	Samaritan Health Systems
Kruse, Jeff	Oregon State Senate
Kuhnert, Brad	Charter Communications
LaBaw, Frances	Klickitat Valley Health Services
Lang, Linda	Peace Health
Larsen, Ellen	
Lucero, Virginia	St. Anthony Hospital
Lukas, Janet	Masergy Comm
Manuel, Brandi	Grande Ronde Hospital
Matthews, Pam	Kaiser Permanente Continuing Care Services
Matthews, Paul	Oregon Community Health Information Network (OCHIN)
Mayer, Doris	St. Anthony Hospital
McLaughlin, Vanessa	Providea Solutions
Moss, Jessica	LS Networks
Myers, Rob	Frontier TeleNet
Nyegaard, Phil	Oregon Public Utility Commission
O'Brien, Laureen	Providence Health System
Olson, Cheryl	Providence Home Services
Olson, Sandy	Asante Foundation
Pace, Robert	Charter Business
Palser, Greg	CoastCom
Parker, Ed	Telehealth Alliance of Oregon board, ORTCC
Pederson, Curt	Oregon Telecommunications Coordinating Council (ORTCC)
Pemberton, Sue	
Perednia, Doug	Kietra
Perkins, David	Kaiser Permanente Continuing Care Services
Pettit, Jody	Q-Corp/Governor's office
Reagin, Mike	Providence Health System
Retzer, Jere	OHSU
Richardson, Dennis	Oregon State Representative
Richter, Skip	Western Independent Networks
Ritchie, Doug	Central Oregon Electronic Medical Records
Robinson, David	Oregon Health & Science University (OHSU)
Ruter, Klaus	Samaritan Health Systems
Ryan, Rich	Hunter Communications
Sabala, Dave	Douglas Electric
Sahn, David	Oregon Health & Science University (OHSU)
Schafer, Marlyn	Oregon Telecommunications Coordinating Council (ORTCC)
Schnadig, Jean	Acumentra Health
Shadley, Link	Mid-Columbia Economic Development District
Shadley, Link	Oregon Telecommunications Coordinating Council (ORTCC)

Name	Organization
Skinner, Don	Oregon Pacific AHEC
Skinner, Ross	CenturyTel
Sneed, John	AHOSST/PCC
Soliday, Sharon	SLP Services, LLC
Spigai, Fran	Community Health Improvement Partnership, Chronic Care Committee
Stewart, Faye	Oregon Telecommunications Coordinating Council (ORTCC)
Straughan, John	Wallowa County Health Care District
Tamarin, Chris	Oregon Economic and Community Development Department
Tarrant Martin, Stephanie	Sweet Home School District
Teal, Jeff	Klickitat Valley Health Services
Thompson, Jim	Oregon State Pharmacy Association
Valentine, Jennifer	Cascades East AHEC
Venzke, Ken	Oregon Health Career Center (OHCC)
Weidman, Michael	LS Networks
Westlight, Don	Oregon Health & Science University (OHSU)
Williams, Jim	LS Networks
Williams, Jim	Charter Business
Wolf, Brant	Oregon Telecommunications Coordinating Council (ORTCC)
Womack, Bruce	Wallowa County Health Care District
Woods, Teri	Charter Business
Young, Joel	Department of Human Services - Public Health
Zastrow, Paul	Oregon Telecommunications Coordinating Council (ORTCC)

While the larger planning group was invested in the establishment of the OHN, the actual development and approval process for the OHN was vested in three working groups: the Network Infrastructure Workgroup; the Business Plan Workgroup; and the OHN Leadership Committee.

The technical development of the OHN was conducted under the auspices of the Network Infrastructure Workgroup, whose membership is represented on Table 2 below.

Table 2: Network Infrastructure Workgroup

Name	Organization
Behm, Dennis	Sparling
Bundy, Larry	Blue Mountain Community College
Burton, Bob	Qwest
Crowe, David	Oregon Internet Exchange (OIX)
Dolan, Jon	Oregon State University
Durrett, Gayland	Southern Oregon Medical Network (SOMN)/Asante
Fidler, Craig	360 Networks
Hughes, Jake	CoNet
Jesuale, Nancy	Easy Street
Jorgenson, Dennis	State of Oregon Data Center
Kuhnert, Brad	Charter Communications
Malone, Greg	Portland Community College
Myers, Rob	Frontier TeleNet
Palser, Greg	CoastCom
Parker, Ed	Parker Telecommunications, TAO, ORTCC
Reagin, Mike	Providence
Retzer, Jere	Northwest Access Exchange (NWAX)
Richter, Skip	Western Independent Networks
Ruter, Klaus	Samaritan
Schmitz, Bob	360 Networks
Simila, Ray	Qwest
Skinner, Ross	CenturyTel
Talmadge, Peter	Embarq
Voss, Thomas	Verizon
Weidman, Michael	LS Networks
Westlight, Don	Oregon Health & Science University (OHSU)

The work of compiling and drafting the OHN Business plan was vested in the OHN Business Plan Workgroup whose membership is reflected in Table 3 below.

Table 3: OHN Business Plan Workgroup

Name	Organization
Anderson, Carla	e-Copernicus
Box, Agnes	Oregon Institute of Technology
Britain, Cathy	Telehealth Alliance of Oregon Board /Asante Health System
Bundy, Larry	Blue Mountain Community College
Dolan, Jon	Oregon State University
Duehmig, Bob	Office of Rural Health
Easton, Andi	Oregon Association of Hospitals and Health Systems
Edvalson, Terry	Pendleton Academies
Forrester, Janice	Regence BCBS
French, Bob	Samaritan Health System
Grunberg, Keith	Charter Communications
Hill, Art	Blue Mountain Community College
Hoffman, Kim	Telehealth Alliance of Oregon Board, Health & Science University (OHSU)
Irwin, John	Oregon Telecommunications Coordinating Council
Matthews, Paul	Oregon Community Health Information Network
McLean, Christopher	e-Copernicus
Olson, Sandy	Telehealth Alliance of Oregon Board, Asante
Parker, Ed	Parker Telecommunications, TAO, ORTCC
Retzer, Jere	Northwest Access Exchange (NWAX)
Rohde, Greg	e-Copernicus
Rose, David	St. Charles Medical Center
Russo, Don	Silverton Hospital Foundation
Short, Gary	Curry General Hospital
Skinner, Don	Oregon Pacific AHEC
Tamarin, Chris	Oregon Economic and Community Development Department

A.   Project Leadership / Governance

The OHN decision-making and approval process has been conducted under the auspices of the OHN
Leadership Committee. This leadership committee represents key stakeholders and telehealth experts in
Oregon whose participation will guide the establishment of the OHN. The names and affiliations of the
OHN Leadership Committee are presented in Table 4 below. (Biographical sketches are provided in
Section XIII – Previous Experience: Development and Management of Telemedicine Programs).

Table 4: OHN Leadership Committee

Name	Organization
Agnes Box	Oregon Institute of Technology
Bell, Jo	Telehealth Alliance of Oregon Board Of Directors
Britain, Cathy	Telehealth Alliance of Oregon Board, Asante Health System
Davidson, Andy	Oregon Association of Hospitals and Health Systems
Dolan, Jon	Oregon State University
Duehmig, Bob	Office of Rural Health
Edvalson, Terry	Pendleton Academies
Ekblad, Scott	Office of Rural Health
French, Bob	Samaritan Health System
Hill, Art	Blue Mountain Community College
Hoffman, Kim	Telehealth Alliance of Oregon Board, OHSU
Irwin, John	Oregon Telecommunications Coordinating Council
Matthews, Paul	Oregon Community Health Information Network
McLaughlin, Vanessa	Providea Solutions
Myers, Rob	Frontier TeleNet
Olson, Sandy	Telehealth Alliance of Oregon Board Of Directors
Parker, Ed	Parker Telecommunications, TAO, ORTCC
Pettit, Jody	Oregon Governor's Office/Q-Corp
Shadley, Link	Mid-Columbia Economic Development District
Skinner, Don	Oregon Pacific Area Health Education Center
Steeves, Ann	HRSA Region 2
Vander Does, Victor	Morrow County Health District

Transitional Governance: OHN Pilot Phase

The initial leadership for the OHN derives from two organizational entities that will assume
administrative and operational oversight in the first two years of operation, which will be considered the
OHN pilot phase: the Oregon Association of Hospitals and Health Systems and the Telehealth Alliance of
Oregon.

Oregon Association of Hospitals and Health Systems (OAHHS)[22] is a statewide healthcare association
providing services and leadership to members through public policy development, advocacy, education,
data analyses and data sharing. OAHHS has two categories of membership, organizational and associate
members. The organizational membership category is made up of 57 hospitals and healthcare systems in
Oregon. Members of the OAHHS Board of Trustees are chosen from this membership category. The
associate membership category is open to a wider variety of organizations that share the association's

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[22] http://www.oahhs.org/

goals. An important sub-group of the OAHHS is comprised of member organizations representing Oregon's small and rural hospitals, which provide services for more than one million people in the state. They are defined by Oregon Revised Statutes (ORS) 442.470 as those hospitals operating fewer than 100 beds and are classified by the state as Type A, Type B, Type C, or Critical Access Hospital, depending on bed size and distance from another hospital.

- Type A hospitals are small and remote and have 50 or fewer beds. They are located more than 30 miles from another acute care, inpatient facility. There are 12 OAHHS members in this category.
- Type B hospitals are small and rural and have 50 or fewer beds. Type B hospitals are located 30 miles or less from another acute care facility. There are 20 OAHHS members in this category.
- Type C hospitals are considered rural and have more than 50 beds, but are not a rural referral center. There are 4 OAHHS members in this category.
- Critical Access Hospitals (CAH). The federal Balanced Budget Act of 1997 established a program for rural communities to preserve access to primary care and emergency health care services, provide health care services that meet community needs, and help assure the financial viability of small, rural hospitals through classification as Critical Access Hospitals. A critical access hospital is able to improve its financial stability through enhanced Medicare reimbursement and reduced operating costs. There are 25 OAHHS hospitals in this category.

Collectively, the OAHHS members comprise a major component of the health leadership in the state of Oregon.

The Telehealth Alliance of Oregon (TAO)[23] is a member organization representing key telehealth expertise and leadership in the state of Oregon. The purpose of TAO is to support the use of telecommunications to improve Oregonians' access to high quality health care and other allied services. TAO has been instrumental in facilitating reimbursement for telemedicine services in Oregon, as well as fostering legislative commitment to the establishment of an Oregon telehealth network in cooperation with the Oregon Telecommunications Coordinating Council. The Oregon legislative commitment was implemented in Senate Joint Resolution 20 in the 2007 legislative session. A copy of that resolution is attached as an appendix to this proposal. The TAO has adopted five objectives as "pillars" for guiding organizational services and activities. These objectives commit TAO to:
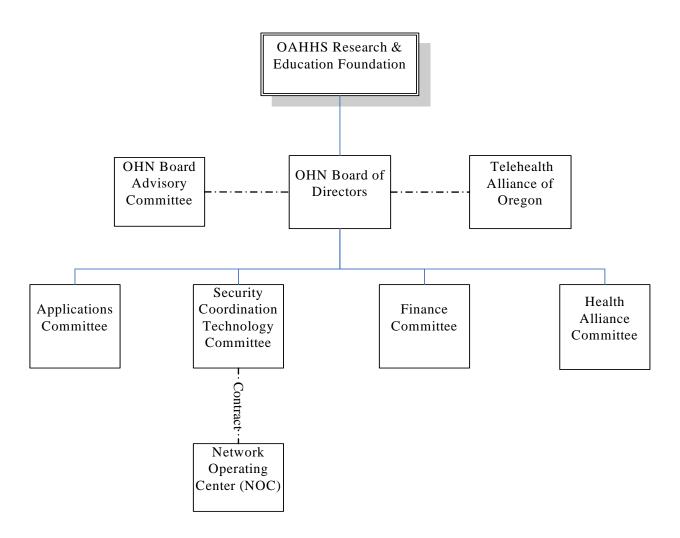
- **Improve access** to high quality health care and other allied services through Telehealth and Telemedicine.
- **Promote collaborations** that advance Telehealth and Telemedicine as a means for improving the delivery of affordable high quality health care.
- **Provide and promote education** to facilitate the understanding of the possibilities and uses of Telehealth and Telemedicine.
- **Provide and support technical assistance** to initiatives that advance programs of Telehealth and Telemedicine in Oregon.
- **Promote research** that supports appropriate decision-making in the delivery of health care using technology and telecommunications.

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[23] http://www.ortelehealth.org/

B.   Management Structure

Collectively, the leadership, organizational structure and operational management of the OHN as described above will facilitate the deployment and sustained operation of an effective, cost-efficient OHN. The organizational structure of the OHN is represented in the following chart.

OHN Organizational Chart

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                    ┌─────────────────────────┐
                    │   OAHHS Research &       │
                    │   Education Foundation   │
                    └─────────────────────────┘
                                 │
   ┌──────────────┐   ┌──────────────────┐   ┌──────────────────┐
   │ OHN Board    │---│  OHN Board of    │---│  Telehealth      │
   │ Advisory     │   │  Directors       │   │  Alliance of     │
   │ Committee    │   │                  │   │  Oregon          │
   └──────────────┘   └──────────────────┘   └──────────────────┘
                                 │
  ┌───────────┐  ┌──────────────┐   ┌───────────┐   ┌───────────┐
  │Applications│ │ Security     │   │ Finance   │   │ Health    │
  │Committee   │ │ Coordination │   │ Committee │   │ Alliance  │
  │            │ │ Technology   │   │           │   │ Committee │
  │            │ │ Committee    │   │           │   │           │
  └───────────┘  └──────────────┘   └───────────┘   └───────────┘
                       ┆ Contract
                 ┌──────────────┐
                 │ Network      │
                 │ Operating    │
                 │ Center (NOC) │
                 └──────────────┘
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C.   Organizational Work Plan and Schedule

The OHN leadership committee will begin immediately to implement the organizational tasks necessary to be ready to begin operations upon notice of approval of this application. The committee will begin to act as an OHN board and will elect officers and appoint management staff. One of the current committee members who participated in this proposal preparation will be appointed as interim technical network manager until the search for a permanent project director is completed. The months indicated on the

following organizational work plan begin in May 2007. The months indicated on the technical work plan begin on notification of approval of this application. However, OHN management intends to work with its technical team, including OHSU technical networking staff, to get started on the technical network planning tasks. This way, we will be ready for a quick start when the application is approved.

WORK PLAN			
GOAL	**MAJOR MILESTONE**	**TARGET COMPLETE DATE**	**RESPONSIBILITY**
1. Oregon will achieve significant advances toward parity in its health related services across its urban, suburban and rural regions through the deployment of the OHN as an independent member organization.	**Pre-Award Activities**		
	Establish Interim OHN Governance Structure	June, 2007	OHN Leadership Committee/TAO
	Develop OHN Articles of Incorporation and Bylaws, select Board Officers, and submit to Secretary of State for incorporation	July-August, 2007	OHN Leadership Committee/TAO
	Convene OHN Leadership as OHN Founding Board of Directors	September 2007	OHN Leadership Committee/OHN Board of Directors
	Develop OHN Committee structure, including roles, responsibilities, meeting and reporting schedule	September-October 2007	OHN Board of Directors/TAO
	Develop, Nominate, recruit, appoint and Convene standing Board Committees to include: • Applications Committee • Security Coordination & Technology Committee • Finance Committee • Alliances Committee • Advisory Committee	October-November, 2007	OHN Board of Directors
	Convene Committees and commence the committee oversight and planning	December, 2007	OHN Leadership Committee/TAO/OAHHS
	Establish policies and procedures for management of funds	January, 2008	OAHHSF/OHN Board of Directors
	Establish budget tracking/reporting process	February, 2008	OAHHSF/OHN Board of Directors
	Ensure all policies, procedures and financial practices meet all federal and state fiduciary requirements	February, 2008	OAHHSF/OHN Board of Directors

	Post-Award Activities		
	Assume management and fiduciary role	Upon Notification of Award	OAHHS Foundation
	Refine OHN Project Plan based upon conditions of award	Month 1-2	OHN Board of Directors/TAO
	Hire OHN Project Director	Month 2	OAHHS/OHN Board of Directors/TAO
	Define Membership roles, responsibilities, voting authorities and sliding fee cost schedule, and communication mechanisms for the organization	Month 3	OHN Board of Directors/TAO
	Confirm OHN sites as members	Month 3-12	OHN Board of Directors/TAO
	Commence/continue ongoing, independent operations of OHN	Month 24	OHN Board of Directors/Committees/ Membership
2. The proliferation of successful telehealth applications across Oregon's most underserved areas will be attained through the active involvement of rural stakeholders and a comprehensive program of education and technical support of rural network users.	Develop a TA package for OHN members to include; support in USF application for subsidy.	Month 3	OHN Board of Directors/TAO
	Hire a Telehealth Coordinator whose role it will be to support TA to OHN member sites	Month 6	OHN Board of Directors/TAO/OHN Project Director
	Meet/confer with OHN sites to determine TA support required	Month 9	OHN Project Director/Telehealth Coordinator
	Support all rural sites in their UFS applications	Month 9 and thereafter	Telehealth Coordinator
	Distribute a survey to solicit needs/gaps/interest of OHN members to expand their telehealth services	10	OHN Board of Directors/OHN Director/Telehealth Coordinator/TAO
	Compile survey results, and based upon responses and $ available, develop prioritization for technical support for members	12	OHN Board of Directors/OHN Director/Telehealth Coordinator/TAO
	Identify and involve all essential stakeholders necessary for prioritized telehealth implementations	16	OHN Board of Directors/OHN Director/Telehealth Coordinator/TAO
	Involve the clinical leadership as essential to develop and implement plans	Month 16	OHN Board of Directors/OHN Director/Telehealth Coordinator/TAO
	Facilitate the implementation of Telehealth applications at OHN member sites as requested/prioritized	Month 18-24	OHN Director of Directors/Telehealth Coordinator
	Develop a 5-year Strategic Plan to guide the operations of the OHN	Month 24	OHN Board of Directors/OHN Director/Telehealth Coordinator/ Membership/TAO/OAHHS

3. An OHN sliding scale fee system and on-going rural health subsidy programs will sustain the active and ongoing participation of rural providers in telehealth applications.	Develop a and sliding scale fee schedule for OHN membership	Month 3	OHN Board of Directors/TAO/OAHHS
	Survey/test the fee schedule with a sample of all communities of interest	Month 6	OHN Board of Directors/OHN Project Director/TAO
	Revise and refine sliding scale fees depending on constituent response	Month 9	OHN Board of Directors/OHN Project Director/TAO
	Finalize fee scale dependent on final number of participating OHN sites	Month 12	OHN Board of Directors/OHN Director/TAO/OAHHS
	Implement fee schedules as members come onboard to the OHN	Month 12	OHN Project Director/OAHHSF
	Develop and implement ancillary strategies to support cost reductions to all OHN members, including but not limited to: • Group purchase of Internet access • Developing rural/small community sites into local Networks to reduce their individual costs	Month 14	OHN Project Director/OAHHSF/Member
	Develop a marketing plan/strategies to expand the number of participating sites in OHN to relevant communities of interest	Month 14	OHN Board of Directors/OHN Project Director/TAO/Marketing contract service
	Implement marketing plan/strategies to expand the number of participating sites in OHN to relevant communities of interest	Month 18	OHN Board of Directors/OHN Project Director/TAO/Marketing contract service
	Revise and Finalize fee scale dependent on final number of participating OHN sites	Month 24 and ongoing	OHN Board of Directors/OHN Director
4. OHN will establish a statewide broadband network and network applications that will improve *access to* and *quality of* care in Oregon, as well as participate in the development of a national health network that will improve the	Contract with Technical Team to develop and Implement NOC Monitoring Plans.	Month 1-6	OHN Board of Directors/TAO
	Contract with NOC Vendor: implement and operate NOC.	Month 3-6	OHN Board of Directors/TAO
	Develop criteria for certifying backbone vendors.	Month 1-3	OHN Board of Directors/Security Coordination Technology Committee/TAO
	Certify backbone network vendors.	Month 4-6	OHN Board of Directors/Security Coordination Technology Committee/TAO
	Develop and release RFP to connect existing health networks.	Month 2	OHN Board of Directors/Security Coordination Technology Committee/TAO

healthcare services available to all U.S. citizens.	Select and contract with vendors to connect existing health networks.	Month 3-6	OHN Board of Directors/Security Coordination Technology Committee/TAO
	Contract with Portland Network Exchange provider for exchange upgrade, implement upgrade	Month 4-6	OHN Board of Directors/Security Coordination Technology Committee/TAO
	Issue RFP for Internet2 access procurement	Month 3	OHN Board of Directors/Security Coordination Technology Committee/TAO
	Select Internet2 access provider, contract for services, and implement access.	Month 4-6	OHN Board of Directors/Security Coordination Technology Committee/TAO
	Request costing information for commercial Internet access at OHN exchange points	Month 3	Security Coordination Technology Committee
	Provide OHN members with information regarding commercial internet access	Month 4	OHN Board of Directors/TAO
	Confirm new site locations want to participate in Middle mile/last mile procurement	Month 3	Security Coordination Technology Committee
	Issue RFP for middle mile/last mile procurement	Month 4-5	OHN Board of Directors/Security Coordination Technology Committee/TAO
	Select Vendors, negotiate contracts and SLA's for middle Mile/last mile access, complete phased implementation	Month 5-18	OHN Board of Directors/Security Coordination Technology Committee/TAO
	Develop plans and implement connections for community of interest networks like pharmacy and health insurance payers	Month 13-18	OHN Board of Directors/Security Coordination Technology Committee/TAO
	Yearly report to FCC and OHN members on previous year activities	Month 12, Month 24	OHN Board of Directors/TAO
	First quarterly report to OHN members on network usage, quality of service.	Month 18	OHN Board of Directors/TAO

IX. OREGON HEALTH NETWORK: TOTAL COSTS

Given that affordability is central to the design of a successful OHN, maximum attention has been directed toward the construction of an OHN budget that both adequately appraises cost elements and attends to ability to pay. A discussion of cost and affordability is presented below in the discussions of budget and sustainability.

OHN is requesting $18,746,486 in non-recurring costs from the FCC over the two-year project period. Most of the non-recurring cost is for one-time construction and installation of broadband network connections to rural health facilities. The non-recurring cost request also includes the cost of connecting major hospitals and current Oregon regional medical networks to OHN, the costs to create a network operations center (NOC) and the cost of Internet2 connections during the two-year period. The NOC development costs could be considered "network engineering" costs, because they include the development and testing of network monitoring tools.

OHN is also requesting $1,436,139 in recurring cost subsidies over the two year project period for eligible non-profit rural health sites. That subsidy is calculated as the difference between the estimated monthly recurring costs at eligible rural sites and the estimated Portland metropolitan area costs for comparable urban service. That recurring cost subsidy request was calculated by annualizing the recurring monthly subsidy numbers calculated for year three, after all core sites are installed (see Table 7 below) and assuming that one quarter of that amount in year one and three quarters of that amount would be required in year 2.

Individual health-related sites will be the "customers of record" for costs charged by telecommunications network vendors, even though subsidies may be passed through OHN. If OHN pays vendors serving locations eligible for subsidy under this program, OHN will do so as agent for the actual users.

OHN Budget Discussion

Core Constituents----The budget that has been developed for the OHN has at its center, costs for a constituency of approximately 500 end users considered to be *core users* of the OHN.

The detail of this budget has been developed individually for the following core constituents:
- Oregon hospitals/69 sites, 34 of which are rural or frontier
- Rural, non-profit clinics/54 sites and all FQHCs/ 141 sites
- Oregon Community Colleges, including all major campuses/ 48 sites
- Public Health Networks, Oregon University Networks, and Emergency Management Networks, and other health sites that are connected to existing hospital networks shall be considered core OHN constituents/200 additional sites, bringing the core OHN constituent sites to 510.

All Oregon *hospitals*, regardless of their rural status, are considered to be core to OHN because they are all critical if we are to be successful in extending access and quality care to rural communities. *The* essential element of telehealth is the remote provision of specialist expertise *from where it exists to where it is needed*. A map of all Oregon hospitals (urban and rural) is provided in Attachment D.

All 54 of Oregon's non-profit *rural health clinics* (RHCs) have been included in the OHN budget calculations. A map of these rural health clinics is provided in Attachment D. Additionally, all of Oregon's 141 *Federally Qualified Health Center's* (FQHCs) have been considered as core sites for inclusion in the OHN. **The OHN requests a waiver to allow all of Oregon's FQHCs, whether classified as rural or non-rural sites, to be qualified for USF subsidy.** These sites are considered to be

a critical component of the OHN because they represent the primary medical home of Oregon's poorest, uninsured and underserved residents. Given the President's expressed intent to bring all FQHCs centrally into the initiative for the portability and exchange of patient Electronic Health Records, these centers are essential in the OHN, and their ongoing ability to participate is contingent upon their eligibility for federal subsidy.

All of Oregon's **community colleges and universities** are included as core to the OHN, given that they are the critical component of a supply chain of adequately prepared healthcare workers—an essential condition of meeting the healthcare needs across the state, now and into the future. Oregon's universities are all currently connected through an existing network (NERO) and connectivity to these sites will be on a network-to-network basis. Finally, Oregon's **public health and emergency management centers,** all members of the state network managed by the Department of Administrative Services (DAS), will also be core to the OHN, and are included in the OHN budget plan on a network-to-network basis. NRCs and MRCs for this extended health related core constituencies are also included in the OHN budget estimates.

Cost Calculations---To ensure that the costs presented in this OHN FCC project, are realistic, the OHN leadership team established a technical committee to undertake the technical plan development for OHN. Members included technical representatives from several Oregon health systems, including Chief Information Officers (CIOs), technical representatives from Oregon educational institutions, and technical representatives from a large number of Oregon telecommunications providers. Membership was open so that no potential vendor or user was excluded. A consensus draft network plan was summarized and served as the basis for an informal Request for Information (RFI). The RFI was posted on the Telehealth Alliance of Oregon website[24] and was mailed to every telecommunications provider in the state of Oregon using the Oregon Public Utility Commission list of all Oregon service providers (RFI is provided as Attachment E). Even though the time available to respond was very short, because of the impending FCC deadline for pilot project applications, 24 responses were received. The responses validated the draft network plan by indicating at least one, and usually more, competitors for almost every element of the plan (where a specific element was absent from the responding bids, like bids were used to estimate a missing cost element). Details for the OHN budget were constructed on the basis of the OHN draft network plan and the detailed RFI responses elements of the budget and are summarized below.

Budgetary numbers for specific sites were submitted as proprietary information, given the competitive nature of telecommunications in Oregon. The RFI respondents understood that the budgetary numbers they provided would be used in this application for funding. They also understood that no contracts or service agreements would be signed until after a formal competitive procurement process.

Discussion of Monthly Recurring Costs (MRC)

MRCs for the core constituents of the OHN have been calculated on two bases:
- Costs for core constituents who currently have no broadband connectivity have been estimated on an end-to end basis. Three increments for Monthly Recurring Costs (MRCs) are calculated: cost to an interconnecting point (NIP); costs from a NIP to a Network Exchange Point; and costs to the Portland end point.
- Costs for core constituents that are current members of existing local/regional/statewide network are calculated on the basis of network-to-network interconnectivity and transport costs only. The end user local area cost is negotiated between the existing network member and their local service vendor and is not calculated in the OHN recurring cost structure provided herein. Full NRCs for this group are also included as a component of this FCC application.

Table 6, below, provides a range of monthly recurring charges proposed by RFI respondents for transmission speeds of 10 Mbps, 100 Mbps, and 1 Gbps to reach locations as segmented by region.

Table 6 – Monthly Recurring Costs to Carriers by Region

OHN CORE SITES: Range of Monthly Recurring Costs (MRC)	Carrier Charges			MRC Port Charges		MRC Backbone/NIP			MRC Backbone/NXP		
	10 Mbps	100 Mbps	GigE	10/100 Mbps	GigE	10 Mbps	100 Mbps	GigE	10 Mbps	100 Mbps	GigE
Backbone				112	375	170	1,300		120	700	5,000
North/Central Coast	675-695	995	2500								
South and South Central	420-725	895-995	1295-2495								
Willamette Valley	670	995-2250	2495								
Cascades Central and Eastern	500-675	975	2495								
Portland Area	325	325	700								

Detailed cost estimates for all monthly recurring costs per participating site are available to the FCC upon request and given the assurance of confidentiality of RFI estimates as guaranteed in the RFI process.

OHN intends that the individual health facilities will be the customers of record responsible for recurring service payments for network services connecting their facility to OHN. OHN will conduct the competitive procurement process to obtain the best services and prices. In some cases, it is possible that OHN will make the contractual arrangements as the agent for an individual health facility. OHN anticipates that, in most cases, the network billing to the end user facilities will be a bundled price that includes local access, middle mile connectivity charges and OHN backbone network charges. In cases where one vendor provides local access and another provides the long-haul transport, two network vendors may bill the end user customer. However, a single point of billing and network contact and responsibility is preferable for network accountability. This will be important in the event service levels fail to meet the quality specified in the service agreements with respect to transit delay, jitter and frequency of dropped packets.

Beyond the estimated vendor MRCs, the costs for the Network Operating Center (NOC) of the OHN and the costs for connection to Internet2 have been calculated as a monthly recurring cost that will be assessed to all users and applied when the OHN is fully operational (year 3 and beyond) as follows:

- Network Operating Center (NOC) monthly recurring costs will be assessed to all users at an amount of $50 per end user per month. This will support this network monitoring (twenty-four/seven) and network oversight services beyond the OHN two year pilot phase.
- A fee of $17 per user per month will support the costs associated with Internet2 connectivity and services beyond the OHN two-year FCC project phase.

Both of these network costs are requested from the FCC in the pilot phase. Support for these costs is required because the first two years of operation are the most significant timeline for engineering and network support and oversight. Participant sites will be phased onto the OHN over the two-year pilot phase, but the full composite of members will not be brought on until the end of year two. The full MRCs will not be collected from participant sites until year 3 of the OHN operation and beyond. At that time, MRCs will be able to sustain the ongoing monthly NOC and Internet2 costs.

When the OHN is fully installed and operational (by year 3 and beyond), it is anticipated that the full monthly recurring costs (MRCs) paid for by the participating sites, inclusive of USF subsidy where appropriate, is projected to be $253,415/per month or $3,040,980/per year. The inclusive USF subsidy is in the amount of $136,555/per month or $1,638,660/per year. OHN requests that the FCC waive the mileage-based transport cost assumptions in current rural health USF rules to remove that requirement for locations where pricing is not based on mileage. Within the Portland metropolitan area, broadband Ethernet rates in the current medical network are not based on mileage. Similarly, most of the responses to the OHN RFI provided prices that are not based on mileage, but are significantly higher in rural locations than in urban locations. OHN requests that the on-going subsidy mechanism reflects this current broadband pricing reality and subsidize the difference between urban and rural rates for comparable services at otherwise eligible facilities in otherwise eligible rural locations.

OHN also requests a waiver from the current rural health USF rules to eliminate the "disconnect/reconnect" requirement. OHN agrees that getting competitive bids is essential to getting the lowest price and understands the need to disconnect and reconnect when changing providers. However, when a telecommunications provider currently serving that location provides the winning bid, we request waiving the disconnect/reconnect requirement when the winning bidder currently serves the facility to minimize service disruptions to medical facilities.

Table 7, below, provides a list of the Monthly Recurring Costs (MRCs) as aggregated by region and by type of service, and additionally reflects the subsidy anticipated from the FCC USF (by region and type of service). Oregon has been a major recipient of FCC universal service funds for the schools and libraries "e-rate" program because Oregon had a state government staff person organize and facilitate Oregon requests for this program. Oregon has not received many of the benefits possible from this program in the past because of the complexity of the rural health program requirements and the lack of a centralized resource for helping eligible applicants through the process. Part of the OHN management plan is to assist eligible rural facilities with the rural health subsidy application process. When the universal service fund rural health program subsidy is available, the net cost for rural governmental and non-profit health care sites is anticipated to be sustainable.

82

Table 7: Monthly Recurring Costs and Anticipated USF Subsidy by Region & Type of Facility

OREGON HEALTH NETWORK (OHN)		
OHN		**USF Subsidy 10/100 Mbps**
OHN CORE SITES	TOTAL MRC	Benchmark: 325[25]
Subtotal / Networks	40,713	21,878
Subtotal N. and Coast Hospitals	10,945	7,370
Subtotal WV Hospitals	34,799	10,942
Subtotal MRC/S Central and S. Hospitals	0	0
Subtotal MRC/Cascades Central and East Hospitals	0	0
Subtotal Portland	718	0.00
TOTAL HOSPITALS	**87,175**	**40,190**
Subtotal MRC N. and Coast Rural Clinics and E. Hospitals	9,910	2,400
Subtotal MRC N. and Coast Rural Clinics and FQHC's	34,861	29,336
Subtotal MRC S. Central and S.Rural Clinics and FQHC's	9,918	5,293
Subtotal MRC Cascade Central and E. Rural	23,861	16,386
Subtotal MRCP FQHC's	44,921	26,071
TOTAL RURAL CLINICS &FQHC's	**123,472**	**79,487**
Subtotal MRC/N. and Coast Community Colleges	8,329	2,858
Subtotal N. and Coast CC's	11,445	4,098
Subtotal S. Central and S. CC's	3,789	800
Portland Community Colleges		
TOTAL COMMUNITY COLLEGES	**42,768**	
TOTAL CORE SITES	**253,415**	
SUBSIDIZED MRC		**119,678**
NON-SUBSIDIZED MRC	**133,736.24**	

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[25] This is the benchmark urban rate. Requested subsidies are calculated as the difference between this and the actual rate in each other location.

Discussion of Non-Recurring Costs (NRC)

As previously described, end users identified as *core constituents* are essential to make the applications and services of the Oregon Health Network available to hospitals and clinics throughout Oregon. Without this full composite of sites, OHN would be unable to offer appropriate services to health facilities in rural locations. Connecting urban hospitals to OHN is essential to having medical services accessible to rural locations through the network. A key benefit of OHN will be to establish the last mile and middle mile connectivity needed to bring the broadband services that OHN can provide to rural hospitals and clinics. Most of the budget for OHN is for bringing broadband services to rural hospitals, clinics, and other related health facilities, including Oregon's Community Colleges that currently lack the reliable and secure broadband network access necessary for telehealth applications.

The OHN RFI requested budgetary estimates for both non-recurring and monthly recurring costs for network capacity to connect rural health care locations to the OHN backbone network at one of the network exchange points (or through one of the network interconnection points). As described in the technology section, no restrictions were placed on the technology used for last mile and middle mile connectivity, provided performance specifications are met. In some locations service might be provided on copper transport, in others on fiber optic cable and yet others by wireless networks. In some communities there is adequate middle mile capacity linking the community to the rest of the state. For those communities, network construction would be required only for last mile facilities from a central office to the end user clinic location. In other communities, "middle mile" facilities need to be constructed to permit broadband connections from that community to the OHN backbone. No "one size fits all" network technology solution was utilized. OHN will seek the best competitive solution for each different location to be served.

RFI respondents, including telephone companies, cable companies, competitive local exchange carriers, wireless carriers and long distance network providers, offered diverse solutions for the different parts of the state they serve. Some offered local access solutions that would need to be paired with an appropriate long distance ("backhaul") provider. Others offered long distance solutions that need to be paired with the solutions of local providers. Still others offered end-to-end solutions for connecting their community health facilities to the Oregon Health Network exchange points. Collectively, the RFI responses have proposed constructive solutions and budgetary estimates for connecting health care locations throughout most of the state of Oregon. Nevertheless, some rural locations would be left without service if we limited the network plans to only those providers responding to the RFI. Cost estimates for reaching those locations are estimates projected from the budgetary numbers of those that did respond.

Table 8, below, provides an aggregate summary of the budgetary proposals for all installations as well as for two years of NOC and Internet2 costs. Installation costs for interconnecting existing networks are shown on the first line of table 8, labeled *Sub-Total/Networks;* where as last mile and middle mile one time construction and installation costs, are organized and summarized by region and type of facility. A breakdown of costs by year one and year two is also shown on Table 8. Two-year costs for NOC and Internet2 are also shown. As previously discussed, the first two years of NOC and Internet2 costs are being requested from the FCC. Because the full composite of OHN members will not be fully connected and receiving services until close to the end of year two, the NOC and Internet2 expenses are not able to be supported by user fees until the start of year three and thereafter. Two years of MRC eligible for USF rural subsidy are also being requested for recurring network costs in the amount of $1,436,139/ Total two-year OHN cost for capital NRC and NOC and Internet2 is in the amount of $23,267,424 of which $18,746,486 is being requested from the FCC and $4,520,938 is being provided as match. (Additional project costs not requested from the FCC are outlined in Section X below.

Table 8: Costs by Region, by Type of Facility, by Year - OHN:

OHN CORE SITES	TOTAL NRC	Year One Cost/Source of Revenue		Year Two Cost/Source of Revenue	
		FCC Project Request	Match	FCC Project Request	Match
Subtotal / Networks	4,965,547	1,545,503.00	1,710,022	0.00	1,710,022
Subtotal N. and Coast Hospitals	833,939	149,329.00	300,447	83,716.00	300,4770.00
Subtotal WV Hospitals	2,628,332.00	2,628,332.00	0.00	0.00	0.00
Subtotal S. Central and S. Hospitals	500,200	200.00	250,0000.00	0.00	250000
Subtotal Cascades Central and E. Hospitals	1,220,200.00	0	0.00	1,220,200.00	0.00
Subtotal Portland	6,400.00	6,400.00	0.00	0.00	0.00
TOTAL HOSPITALS	**10,154,618**	**4,329,764.00**	**2,260,469**	**1,303,916.00**	**2,260,469**
Subtotal N. and Coast Rural Clinics and FQHC's	998,384.00	0.00	0.00	998,384.00	0.00
Subtotal N. and Coast Rural Clinics and FQHC's	2,311,801.00	0.00	0.00	2,311,801.00	0.00
Subtotal S. Center and S.Rural Clinics and FQHC's	2,960,057.00	1,011,050.00	0.00	1,949,007.00	0.00
Subtotal Cascade Central and E. Rural Clinics and FQHC's	1,388,536.00	203,950.00	0.00	1,184,586.00	0.00
Subtotal MRCP Portland FQHC's	185,600.00	185,600.00	0.00	0.00	0.00
TOTAL RURAL CLINICS &FQHC's	**7,844,378.00**	**1,400,600.00**	**0.00**	**6,443,778.00**	**0.00**
Subtotal MRC/N. and Coast Community Colleges	1,037,101.00	523,425.00	0.00	513,676.00	0.00
Subtotal N. and Coast CC's	593,731.00	593,731.00	0.00	0.00	0.00
Subtotal Cascades Center and E CC's	327,455.00	327,455.00	0.00	0.00	0.00
Subtotal S. Center and S. CC's	2,419,541.00	94,875.00	0.00	2,324,666.00	0.00
Subtotal Portland	9,600.00	9,600.00	0.00	0.00	0.00
TOTAL COMMUNITY COLLEGES	**4,387,428.00**	**1,549,086.00**	**0.00**	**2,838,342.00**	**0.00**
TOTAL CAPITAL COSTS/CORE SITES	**22,386,424**	**7,279,450.00**	**2,260,469**	**10,586,036.00**	**2,260,469**
TWO YEAR NOC/INTENET2 COSTS	**881,000.00**	**450,500.00**	**0.00**	**430,500.00**	**0.00**
USF recurring subsidy	**1,436,139**	**359,035**		**1,077,104**	
GRAND TOTAL-FCC PROGRAM COSTS	**24,703,563**	**8,088,985**	**2,260,469**	**12,093,640**	**2,260,469**
TOTAL BY REVENUE SOURCE					
FCC Pilot Program	**20,102,625**	8,088.985.		12,093,640.	
OHN Match	**4,520,938**		**2,260,469**		**2,260,469**
GRAND TOTAL	**24,703,563**	**8,088,985**	**2,260,469**	**12,093,640**	**2,260,469**

Detail for each element of this NRC budget is available to the FCC upon request, and with the assurance of confidentiality as guaranteed to the OHN RFI respondents, whose estimates served as the base for the construction of the NRC summary table.

Matching Funds

OHN Leadership undertook a series of surveys and discussions with representatives from existing network members who are participating in this OHN project. These representatives were queried regarding the initiatives that they were willing to undertake, relative to infrastructure, equipment and applications (specifically EMRs) that would either expand or enhance the OHN infrastructure serving the OHN participant members. A composite list was compiled, and network members signed agreements committing their networks to partner with the OHN, specifically to provide the funds that would serve as match to those requested from the FCC pilot program. Signed agreements are included in Section IX – Oregon Health Network: Total Costs.

OHN match is being provided from the following OHN network participants:

Name	Description	Amount
Oregon State Data Center	Matching Funds Pledged	$575,044
Providence Medical Centers, Oregon	Matching Funds Pledged	$1,890,000
Asante Health System	Matching Funds Pledged	$500,000
Frontier Network	Matching Funds Pledged	$955,000
S. Coos Hospital	Matching Funds Pledged	$600,894
TOTAL MATCH FUNDS	**COMMITTED FUNDS**	**$ 4,520,938**

Match letters are found at the end of this section.

The Sources of Funds Table below delineates the FCC-related cost/source for OHN, including non-recurring costs and NOC and Internet2 costs over the two-year FCC pilot period.

Oregon Health Network: Total FCC-Related Costs by Source

OHN: SOURCE OF FUNDS TABLE			
	Non-recurring Costs	**Recurring Costs**	**Totals**
FCC Year 1	$7,729,950	$359,035	$8,088,985
FCC Year 2	$11,016,536	$1,077,104	$12,093,640
FCC Total	**$17,865,486**	**$1,436,139**	**$18,746,486**
Matching Year 1	$2,260,469	$0	$2,260,469
Matching Year 2	$2,260,469	$0	$2,260,469
Match Total	**$4,520,938**	**$0**	**$4,520,938**
GRAND TOTAL	**$23,267,424**	**$1,436,139**	**$24,703,563**

Oregon

Theodore R. Kulongoski, Governor

Department of Administrative Services
State Data Center Division
530 Airport Road SE
Salem, OR 97301
Phone: (503) 378-2176
Fax: (503) 378-2736

May 3, 2007

The Honorable Kevin Martin, Chairman
Federal Communications Commission
445 12th Street, SW
Washington, DC

RE: Rural Health Care Pilot Program Application
           Oregon Health Network
           State of Oregon

Dear Chairman Martin:

I am writing to express my support for the application filed by the Oregon Health Network (OHN), under the Rural Health Care Pilot Program.

The State of Oregon Network connects to County and other Health Agency locations, various non-profits (for-profit businesses are not allowed to connect to the state network by statute), and numerous state run medical facilities. Those facilities include the State Mental hospital and Eastern Oregon State Hospital; as well as correctional facilities that include medical services. We also provide information based medical systems such as the Medical Management Information System, general Public Health information, and other medical applications which require us to run the state network in compliance with HIPPA standards. The State of Oregon Network also carries data transport of several emergency management agencies and applications including Amber Alerts, TripChek, OSP, Office of Emergency Management and LEDS. The State Network is also working with the Oregon Wireless Interoperability Network to provide interoperability with first responders throughout the State which will include communications to the local Health Providers around the state.

The State of Oregon Network is already connected at the Oregon Internet Exchange (OIX) in Eugene and the NorthWest Access Exchange in Portland. The State of Oregon Network will connect to the Oregon Health Network at both of those locations to ensure that these Medical sites and services are part of the overall OHN and will full participate in the deployment of this important statewide network for health services.

The State of Oregon Network connects more than 2000 end sites supporting agency offices statewide. In the next biennium (2007-2009) we have planned and budgeted a complete network core upgrade that will bring very high speed Ethernet services to the rural parts of our great state. The approved budget for the operation and upgrade of the State of Oregon Network in the next biennium is $39,658,229 and includes services and supplies, personal services, working capital and depreciation. Of the approximately 2000 end sites, 39 are specifically health related as county health offices etc., representing 1.45% of the overall network. Based on this you may consider a total of $575,044 of our biennial budget to act as matching funds towards the development of the Oregon Health Network.

Sincerely,

Al Grapoli
Network Manager
Oregon State Data Center

Providence Health & Services
System Office
506 Second Avenue, Suite 1200
Seattle, WA 98104-2329
(206) 464 3355
www.providence.org

✚ PROVIDENCE
Health & Services

May 2, 2007

Cathy Britain
C/O Telehealth Alliance of Oregon

RE: Match funds for the Oregon Health Network

Greetings,

This letter documents the Providence Health & Services match commitment for the grant proposal to the FCC for the **Oregon Health Network** pilot project. We have plans to invest **$1,890,000** on network infrastructure and electronic health record development in Oregon over the next two years. This letter grants permission to show this amount as matching funds for the grant application and can be included as part of the proposal packet delivered to the FCC in Washington D.C.

Thank you in advance for your consideration.

Sincerely,

John Jay Kenagy
Vice President & Chief Information Officer
Providence Health & Services

JJK:rb

May 3, 2007

Catherine Britain
Telehealth Alliance of Oregon

RE: Match funds for the Oregon Health Network

Greetings,

This letter documents the Asante Health System match commitment for the Oregon Health
Network application to the Federal Communication Commission Rural Health Care Pilot Program.
We have plans to invest $500,000 on network infrastructure and electronic health record
development in southern Oregon over the next two years. This letter grants permission to show
this amount as matching funds for the application and can be included as part of the proposal
packet delivered to the FCC in Washington DC.

Thank you in advance for your consideration.

Sincerely,

Mark Hetz
Chief Information Officer
Asante Health System

MH:csb

ASANTE®
HEALTH SYSTEM

FRONTIER TELENET
Condon, Oregon

April 26, 2007

TO: Cathy Britain
                TeleHealth Alliance of Oregon
                RE: Oregon Health Network Project

FROM: Rob Myers
                Frontier TeleNet

SUBJECT: Frontier TeleNet Infrastructure Investment as qualified OHN project match

Frontier TeleNet has dedicated funding to complete the following network expansion elements within 24 months of the date hereon:

1) CENTRAL OREGON – Site development, engineering, radios, antennae, installation, testing and optimization -- **$655,000**
2) GRANT COUNTY – Site development, engineering, radios, antennae, installation, testing and optimization -- **$300,000**

TOTAL Network Expansion/ Enhancement Investment within the next 24 months: **$955,000**

If more information is needed, please contact me.

Best Regards,

Rob Myers
Frontier TeleNet
Condon, Oregon

From:	David Rollins [cfo@southerncoos.com]
Sent:	Thursday, April 26, 2007 4.06 PM
To:	'Britain, Cathy'
Subject:	RE: OHN Match funds
Attachments:	Southern Coos HIS.xls

Cathy,

Attached is a spreadsheet outlining our expected costs over the next 36 months for our infrastructure build and HIS implementation. We have not committed to a particular vendor at this point so we are only able to commit to 50% of our estimated Phase I & Phase II estimated costs which is approximately $600,894 over the next 12-18 months.

David Rollins

Southern Coos Health District
HIS Implementation Plan

Phase I	Jun 07 - Dec 07	Infrastructure buildup, network connectivity, ServeRX
Phase II	Aug 07 - Feb 08	HIS Go-Live: Business, Nursing, Pharmacy, Radiology, Laboratory modules
Phase III	Mar 08 - Sep 08	HIS Go-Live: Clinical documentation, Operating Room, Emergency Room
Phase IV	Oct 08 - Sep 09	HIS Go-Live: Physcian Order Entry, Care Plans, Telehealth foundation

	LEGEND	
Phase I	Phase I: SCHD IT Support	60,000
Phase II	Phase II: SCHD IT Support	50,000
Phase III	Phase III: SCHD IT Support	70,000
Phase IV	Phase IV: SCHD IT Support	120,000
Phase I	ServeRX	84,788
Phase III	Webserver, intranet	15,000
Phase I	Server Cabinet	15,000
Phase I	HIS Hardware	125,000
Phase II	Business software	7,000
Phase II	Computer/Printers	35,000
Phase I	Consultants	20,000
Phase I	Active Dir/DNS server	25,000
Phase I	Backup server	15,000
Phase I	File/Print server	15,000
Phase II	Phase II: Software License	125,000
Phase III	Phase III: Software License	50,000
Phase IV	Phase IV: Software License	25,000
Phase II	Phase II: Implementation - Vendor	500,000
Phase III	Phase III: Implemenation - Vendor	175,000
Phase IV	Phase IV: Implementation - Vendor	125,000
Phase II	Phase II: Implementation - SCHD	125,000
Phase III	Phase III: Implemenation - SCHD	50,000
Phase IV	Phase IV: Implementation - SCHD	35,000
Phase II	Phase II: Support / Training**	141,661
Phase III	Phase III: Support / Training**	33,330
Phase IV	Phase IV: Support / Training**	-
		2,041,779

* Some costs may be split between 2 or more phases

2007	866,217
2008	835,568
2009	376,659
2010*	79,996
* thru Jun 2010	2,158,440

FY07	77,000
FY08	1,325,025
FY09	509,756
FY10*	246,659
* thru Jun 2010	2,158,440

Expenses by Phase:

Phase I	535,359
Phase II	666,429
Phase III	401,665
Phase IV	438,326
	2,041,779

** Phase II Support Training begins 60 days after end of phase, the same is true for Phase III & IV

Funding	Phase I	Phase II	Phase III	Phase IV	
total	535,359	666,429	401,665	438,326	2,041,779

*** Phase III & IV Vendor Implementation costs

X. FINANCIAL SUPPORT: SOURCE/ANTICIPATED REVENUE

While the discussion above fully addresses the capital non-recurring costs that are being requested from the FCC pilot program, as well as those which are offered as match, it does not address the additional costs and sources of revenue that are anticipated to be critical to begin OHN operations, and bring it to the point of sustainability. The following table has been prepared to show the full OHN project costs over five years, and the sources of revenue that are both projected and required to meet a sustainable operation by year five of the OHN operation.

Table 9: Five-Year Forecast of Revenue and Expenses

5 YEAR FORECAST REVENUE & EXPENSES					
REVENUE	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**
FCC Project Request	8,088,985	12,093,640			
OHN Matching Funds	2,260,469	2,260,469			
Membership Fees	155,000	164,250	325,000	350,000	375,000
Private Grants/Donations	250,000	320,000			
Monthly Recurring Charges for NOC/In2	100,500	134,000	522,600	562,800	603,000
Total Revenues	10,854,954	14,972,359	847,600	912,800	978,000
EXPENSES	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**
NRC (Capital)	9,539,919	12,846,505			
Administration	155,000	164,250	172,463	181,086	190,140
NOC/Internet2	450,500	430,500	434,805	439,153	443,545
Project Start-up Costs	250,000	300,000			
USF Subsidy Years 1 & 2 OHN fee subsidy years 3-5	359,035	1,077,104	325,000	325,000	325,000
Total Expenses	10,754,454	14,818,359	932,268	945,239	958,684
Operating Margin	100,500	154,000	-84,668	-32,439	19,316
Cumulative Carry forward	100,500	254,500	169,833	137,394	156,709

ASSUMPTIONS:

1) The only monthly recurring telecommunications costs included are the eligible USF subsidy portion in years 1 and 2.

2) FCC requested funds shown as revenue above are consistent with those detailed in Table 8 above.

3) Membership fees are anticipated to be on a slide scale between $100 and $1000 per/year and are projected in this forecast at an average cost of $500. Year 1 assumes 300 members of and Year 2 projects 317 members.   All 510 core members will be connected by the end of Year 2. After the member drive in Year 2, membership in Year 3 is projected at 650 members (510 core users and 140 new members from related communities of interest). Year 4, projects 700 members, and Year 5 and beyond projects 750 members.

4) Project start-up costs including Technical Assistance to users, regional travel for TA, office equipment and supplies, member materials and a membership drive are estimated for Year 1 in the amount of $250,000 and Year 2 in the amount of $300,000. Private grants and donations are projected as the source of funds providing payment for these activities. Activities will be adjusted to revenues received.

5) NOC costs are calculated at $50/per month/per user (which pay for the ongoing network management oversight and 24/7 monitoring). Internet2 is calculated at $17/per month/per user. Break even for yearly reoccurring costs for NOC and Internet2 are met with approximately 535 users. In Year 3-5, the NOC and Internet2 monthly reoccurring charges derived from the additional 150, 200 and 250 members projected respectively from communities of interest (above the 510 core users) will support the administrative management of the OHN, also essential to it's core operation.

6) USF Subsidy is being requested in years 1 and 2 as part of this FCC program. Technical Assistance will be provided to sites during the pilot phase to help them establish their USF subsidy directly, and so those funds are not shown to continue on the forecast above in years 3-5. It is the intent of the OHN to compile and distribute subsidy that is additional to USF support for rural and small users. This will be funded by the OHN and will be provided on a sliding scale basis. This will be required because some of the smallest users, will require additional support (above USF funds) to participate as members. The additional subsidy, along with the ongoing management administration of the OHN will be sustainable when a full composite of 750 members is achieved.

7) Carry forward in years 1 and 2 support the full operation of the OHN in years 3 and 4 while there is a negative operating balance, providing essential support until the full composite of 750 members is achieved in Year 5 and ongoing member fees are able to sustain operation of the OHN.

Sources of Revenue:

FCC Pilot Program---Year One: $8,088,985; and Year Two: $12,093,640. (These costs are summarized on Table 8 above).

The FCC is being requested to support all the capital NRCs that are required to provide broadband connection to the core users and existing medical networks to form the OHN. Additionally, the FCC pilot program is requested to support the NOC and Internet2 costs for years one and two that are essential to the establishment of the OHN. These costs will be incurred prior to all the OHN users coming onboard. The capacity to fully support these critical OHN connectivity, engineering and oversight costs will be established by year 3 and will be maintained thereafter, when 535 members are onboard. Finally, the USF

subsidy for rural MRCs are also requested as a component of this pilot program. (These revenues/expenses are shown on Table 9 above).

Matching Funds---Year One: $2,260,469; and Year Two: $2,260,469

As discussed in the previous section, the State of Oregon Data Center, Providence Medical Centers, Oregon, Asante Health System, Frontier Network, and S. Coos Hospital are offering capital matching funds in the amount of $4,520,938 during the two year FCC pilot project. These funds will be employed to expand and enhance network infrastructure, equipment or community EMR systems, thereby improving the overall telehealth capacities of the OHN.

NOC and Internet2 monthly fees—it is anticipated that one half of the 510 core users will come onboard in year one and the additional core users will be brought onboard by the close of year two. NOC and Internet2 revenues are estimated in the amount of $100,500 in year one and $134,000 in year two. These fees will be carried forward to cover the costs of managing and administering the OHN during years 3 and 4 where a negative operating margin is anticipated. (Full NOC and Intenect2 costs can be met with MRC from 535 end user sites).

Grant/private donations—It is anticipated that the OHN will successfully raise $250,000 in year one and $320,000 in year two from grant and private sources to support the project costs required to provide the services OHN would like to provide. These costs include personnel, including technical assistance and applications assistance support, a membership drive campaign, office equipment, travel, travel, supplies to enact the project work plan previously presented. Support for this project statewide has been overwhelming. It is anticipated that the OHN will successfully meet the private fundraising goal challenge.

Membership fees—Annual member fees are anticipated on a sliding scale basis from $100 to $1000, with an average cost of $500. Membership fees as shown in Table 9 above are anticipated to increase as total members increase in years 1-5, until they are at a sustaining level in year 5 with 750 OHN members. Fees from membership, in combination with NOC and Internet2 charges are able to support the NOC, Internet2, administration and a sliding scale subsidy for rural and small users by year 5 and beyond, as shown in Table 9 above. In combination, the sources of revenue represented above in Table 9, combine to collectively provide sufficient sources for the expenses as delineated in Table. Further discussion follows in Section XI. Sustainability Plan.

Note: Costs of end user site equipment and maintenance, as well as costs for software and licensing fees for telehealth applications, will be the responsibility of network users. It is anticipated that the OHN will facilitate the procurement of grants and subsidies to support telehealth activities of OHN members as is available and appropriate.

XI. OHN: SUSTAINABILIY PLAN

The main barrier for rural hospitals and clinics to join the current age of telecommunications has been the steep nonrecurring costs associated with getting adequate broadband capacity to their facilities. Once the initial capital costs are invested, on-going monthly costs are expected to be sustainable, especially for rural locations eligible for ongoing subsidy from the FCC's universal service fund rural health program. OHN will be sustainable when Oregon's healthcare, health education, public health and emergency management entities all find sufficient benefit to pay the ongoing costs. Connecting the existing Oregon health networks together should provide a sufficient critical mass of health sites on the network to make it attractive for other hospitals and clinics to join OHN, provided the costs are affordable. Building upon this critical mass, the most vital component of both participation and sustainability is the principle of *Value Added.* The OHN costs are of two types: 1) new sites without current broadband access, and 2) a nominal additional cost to proposed sites that are already a part of an existing network. It is projected that OHN costs will be acceptable and desirable to both groups of core constituents on the basis of *value added.* Those **values** are multifold as follows. First, those sites without broadband **access** are simply now denied the expanded and enhanced quality of care that is inherent with telehealth capacities. Secondly, those core constituents who are currently connected to a local or regional network, network users are frustrated by both the limitations of access to other healthcare entities as well as to the **reliability and quality** of service level now being experienced on their telecommunication networks. Access on existing networks is usually limited to a relatively small number of members who are either in a local area, or members within a single system. Existing networks, which often rely on circuitous, out of state Internet transport, find that even basic services such as video conferencing, suffer from maladies such as dropped data packages or jitter: a service quality that bodes ill for the more quality sensitive telemedicine applications.

Value added by the OHN for new and existing telehealth users includes direct **access** to any health, health education, emergency management entity in the state of Oregon, and via Internet 2 or Lambda Rail, to a national health related constituency. **Quality** is insured by expanded capacity, retaining data locally or in state, and improved system quality and **reliability**. We believe that these enhancements will garner a vibrant and active OHN constituency, and sustain their continued involvement.

Value added is additionally a component of **services.** It is the intent of the OHN to provide critical services to OHN members including, technical assistance, support in grant and subsidy applications, group purchasing and vendor relations, and advocacy and facilitation for expanded telehealth applications and reimbursement.

A final value added component will include improving **affordability. Affordability** of the OHN will be approached from several perspectives. First, when the OHN actively begins its procurement process, RFPs will encourage vendor responses that approach middle mile and last mile solutions from the perspective of creating additional local/regional networks. This will allow new sites being brought on to experience the benefits of reduced costs derived from network-to-network connectivity vs. independent, single site connections.

Secondly, the OHN will consider and explore all viable options for group rate savings, some of which, such as costs for basic Internet access, may be substantial and may significantly reduce the costs of membership in the OHN system. The prospect of group-negotiated rates and services are heightened by the volume system of telecommunication users presented by the OHN.

Thirdly, the OHN intends to actively seek support from the USF in the following ways:
- Waiving the current distance component of the USF subsidy calculation and allowing a differential calculation between rural site costs vs. low urban site career costs.
- Additionally, we seek to include FQHCs as eligible for USF support, regardless of setting, because of their critical core participation as described above.
- Finally, we seek permission from the FCC to treat basic network management costs, as an allowable monthly unit cost, recoverable from the USF subsidy and reimbursement structure.

A most important aspect of the OHN sustainability plan, as previously described, is to expand the number of OHN participants. The larger the base over which to spread fixed costs, the lower the costs will be per participant. The OHN has been projected as a sustainable model at 750 users/members. OHN will recruit membership from all health facilities in Oregon, whether or not eligible for USF subsidies. In addition OHN will recruit membership from among other *Communities of Interest* relevant to healthcare. The initial communities of interest that have been identified are a composite of relevant Oregon Licensees as follows:

Oregon Licensees

Retail pharmacies www.pharmacy.state.or.us	1,090
OR Healthcare Assoc (assisted. living, in-home, nursing homes, etc.)	570
Ophthalmologists http://www.bme.state.or.us/search.html	725
Diagnostic Radiologists http://www.bme.state.or.us/search.html	690
Radiology http://www.bme.state.or.us/search.html	694
Insurance Carriers (individual medical plans) http://www.cbs.state.or.us/external/ins/consumer/health-insurance/individual-plans.html	12
Dentists (OR BD of Dentistry 971-673-3200)	3,483
Total	**7,264**

Initial approaches have been made to these constituencies, and their responses have been positive. We have therefore made initial projections that will be tested by more formal survey measures, and anticipate that OHN users can be expanded by a minimum of 50%. Anything beyond 750 members/users (an additional 240 members over the core membership of 510) will bring further cost reductions and relief to core constituents. These revenues will continue to be captured and will be applied and distributed to rural and small core OHN constituent members on a formally developed sliding scale basis in order to stimulate and support their adoption of additional telehealth and telemedicine applications. The full implications of the OHN revenues/expenses and sustainability over a five-year period (required for full network sustainability) are represented in Table 9 in Section XII above.

Collectively, OHN will actively pursue the cost reduction strategies outlined above and apply them as cost savings to the rural and small size participants—serving those most in need of telehealth capacities is the basic premise of the OHN, as it is a critical dimension of improved quality care. The sustainability plan of the OHN has been developed to support a viable, ongoing OHN operation, with technical monitoring and network management oversight as a component of the cost structure. Because affordability is an important component of the OHN plan, the initiatives that will be undertaken by the OHN over its initial years of operation will be calculated to improve affordability, thereby ensuring a sustainable OHN operation.

XII. OREGON HEALTH NETWORK: FOR PROFIT PARTICIPATION

For-profit healthcare-related organizations in the state of Oregon will be actively recruited to become members of the Oregon Health Network and to have their facilities connected to the network. Even though for-profit entities and urban locations will not be eligible for on-going rural health subsidies from universal service funds, OHN intends to interconnect all heath-related organizations in the state of Oregon. For-profit participation in OHN is an important part of the sustainability plan. As discussed in more detail in the sustainability discussion in section XI above, OHN will actively recruit for profit physician offices and clinics and other health-related businesses. The larger the base of network participants the more valuable the network will be to each member and the easier it will be to sustain the network after the initial funding period.

XIII. PREVIOUS EXPERIENCE: DEVELOPMENT & MANAGEMENT OF TELEMEDICINE PROGRAMS

Oregon Association of Hospitals and Health Systems Research and Education Foundation (OREF)

The Oregon Association of Hospitals and Health Systems is a non-profit, dues-supported, statewide trade association representing hospitals and health systems across the state. OAHHS members include Oregon's 57 acute care hospitals of which 36 are small and rural, 10 health care systems and numerous professional associations who conduct business with health care facilities. OAHHS provides representation, advocacy and assistance for hospitals and systems state and federal lobbying, education and information sharing meetings and quality and patient safety initiatives. Through leadership and collaboration among health care providers, OAHHS promotes quality health care that is adequately financed and universally accessible.

OREF was established in 1989, in part, to "develop qualified financial resources to carry out programs to assist the association, its members, the public and relationships to healthcare." The foundation is a 501(c)(3) non-profit corporation registered in the State of Oregon. While OREF is organized solely for the benefit of OAHHS, it has a separate board of directors, who oversee its activities and financial operations.

The Bylaws for OREF state that the purpose of the foundation is to "study problems in the healthcare provider area and in other related healthcare activities. This organization has found a need to study and present findings regarding quality patient care, operational efficiencies, cost containment, problems in rural areas and alternative delivery methods for hospitals and related healthcare services. It intends to provide educational programs to individuals and institutional representatives in the areas of healthcare, administration, finance and service. In addition, it plans to develop qualified financial resources to carry out programs to assist the association, its members, the public and relationships to healthcare."

OREF Grant Experience

Since its inception in 1989, OREF has managed projects on an on-going basis on behalf of Oregon's hospitals to fulfill its stated purpose.

Its most recent projects have been implemented in 2001 and 2003. In 2001, OREF was awarded a $100,000 grant from HRSA, Office of Rural Health to develop financial analysis for interested Critical Access Hospitals with specific regard to Outpatient Prospective Payment System Standards. In 2003, OREF was awarded a $25,000 grant from HRSA, Office of Rural Health which enrolled Oregon's Critical Access Hospitals in a distance learning program called CareLearning.

OAHHS Grant Experience

In addition to the grants managed by OREF, OAHHS has also managed several grants to benefit hospitals in recent years.

In 2005, OAHHS began administering the HRSA Bioterrorism Grant program to all Oregon hospitals and other healthcare stakeholders. The purpose of this grant is to strengthen response capabilities to bioterrorism incidents or other public health emergencies. By the end of 2008, over $17 million of funds will have been distributed to more than 120 members from the spectrum of the heath care delivery system

including, hospitals, EMS, tribal and neighborhood clinics. OAHHS has been responsible for providing the staff to manage the funds distribution, validate the appropriateness of the funds requests, and to provide the financial management to account for these funds as they are being distributed.

Another area of activity for OAHHS has been development of adequate healthcare workforce for the future needs of Oregonians. As part of their involvement, OAHHS was awarded a $40,000 Healthcare Initiative Assessment grant from the Department of Community Colleges and Workforce Development. This project supported the promotion and empowerment of local coalitions of health care providers, educators and others who could develop locally responsive proposals for introducing simulation-training centers to local communities throughout Oregon.

A second project around the issue of adequate healthcare workforce occurred in 2005-2006. OAHHS acted as the project manager for the Community College Healthcare Action Plan (CCHAP) activities in a $74,000 grant. The project funding came from the Department of Commerce Public Telecommunications Facilities Program Grant. The name of the grant project was Allied Healthcare for Oregon: Seeking Solutions through Telecommunications (AHOSST).

The AHOSST project was designed to study the telecommunications capacity of Oregon's seventeen community colleges to determine their readiness to provide healthcare workforce education via telecommunications methods. The report generated by the AHOSST grant has been used as part of the basis for the needs assessment to develop this project proposal. The OAHHS experience and interest in this grant places OREF in a lead position to provide the legal and fiduciary responsibility for an FCC project in Oregon.

Telehealth Alliance of Oregon

The Telehealth Alliance of Oregon (TAO) is a member organization representing key telehealth expertise and leadership in the state of Oregon. The purpose of TAO is to support the use of telecommunications to improve Oregonians' access to high quality health care and other allied services. TAO has been instrumental in facilitating reimbursement for telemedicine services in Oregon and obtaining legislative commitment to the establishment of an Oregon telehealth network.

Background: In 1997, the Oregon Telecommunications Forum Council (OTFC), a legislatively formed council to ensure that all Oregonians have affordable access to broadband telecommunications infrastructure, adopted as one of its goals to "increase the quality of local healthcare available in all area of the state through telecommunications." The Council created a telehealth workgroup made up of telehealth providers, hospitals, state healthcare boards, state health care associations, healthcare payers and many other interested parties. This group identified a number of telehealth premises:

- To every extent possible, quality healthcare should be available to all Oregonians in their home communities.
- To assure that all Oregonians have the best access possible to quality healthcare, telemedicine should be considered as an appropriate tool for the delivery of services.
- To the extent that it can reduce healthcare costs while maintaining quality of service, telemedicine should be considered as an appropriate tool for the delivery of services.

The workgroup developed and was successful in convincing the 1999 legislature to pass SB 600, a bill creating telemedicine licensure in the State. Although the outcome was not completely satisfactory, the effort represented the first time representatives from all avenues of healthcare and telecommunications had collaborated to create a solution to one of the barriers to the successful application of telehealth. With

the disbanding of the OTFC in 1999 the telehealth workgroup was disbanded as well.

In 2001, the legislature created the Oregon Telecommunications Coordinating Council (ORTCC). The mission of the ORTCC is to "provide all Oregonians with affordable access to broadband digital applications that will improve the quality of life in Oregon communities and reduce the economic gap between well-served and underserved Oregon communities for present and future generations." In considering the committees needed to accomplish its tasks, the Council agreed that a telehealth committee should be established. Many of the same people and organizations involved in the previous workgroup agreed to join the new committee. They also agreed to continue to build on the work of the previous workgroup. The committee determined that one of the largest barriers to the successful application of telehealth was that of reimbursement. The committee also determined that a separate organization, independent of the ORTCC, should be formed to continue the work of creating successful telehealth services in Oregon. The Telehealth Alliance of Oregon (TAO) was formed.

Through the efforts of TAO, House Joint Resolution 4, which established that it is Oregon's policy that payers should reimburse for telemedicine, was passed in Oregon's 2003 legislative session. Since that time, TAO has worked with many of Oregon's payers to negotiate contract language to secure reimbursement for telemedicine services.

In March of 2004, TAO adopted Articles of Incorporation and By-Laws to become an independent, not for profit membership organization dedicated to the advancement of telehealth services throughout Oregon. To accomplish this mission, TAO has adopted five Objectives as the "pillars" for guiding the organization's initial services and action plan. They are to:

- **Improve access** to high quality health care and other allied services through Telehealth and Telemedicine.
- **Promote collaborations** that advance Telehealth and Telemedicine as a means for improving the delivery of affordable high quality health care.
- **Provide and promote education** to facilitate the understanding of the possibilities and uses of Telehealth and Telemedicine.
- **Provide and support technical assistance** to initiatives that advance programs of Telehealth and Telemedicine in Oregon.
- **Promote research** that supports appropriate decision-making in the delivery of health care using technology and telecommunications.

  Program efforts include but are not limited to:

- Developing specific resources, including the acquisition of equipment and infrastructure, needed to provide a broad array of telehealth services to Oregonians;
- Providing a vehicle for organizations and practitioners to aggregate demand for purchasing telecommunications services to gain the benefits of economies of scale necessary to make telehealth services affordable;
- Providing technical and research assistance to aid organizations, agencies and providers in making decisions about their technology and telecommunications services needs and in planning to acquire these services;
- Investigating and studying conditions and possibilities that will result in the removal of barriers to telehealth services providers in serving Oregonians;
- Assembling and coordinating information relative to the status, scope, cost and possibilities of improving telehealth services in Oregon and reporting such information to the health care community, state policy makers, and the telecommunications services community;

- Publishing, disseminating and distributing information and statistics acquired on the impacts of the improvements, or the lack thereof, of telehealth services in Oregon; and
- Cooperating with health care providers, payers, telecommunications providers, planning agencies and policy makers for the purpose of promoting collaborations to improve access to and delivery of telehealth services.

TAO remains dedicated to its mission and goals, and believes that the establishment of an Oregon health network is critical to Oregon's ability to provide access to quality health care for all of its citizens. TAO, working in partnership with the Oregon Association of Hospitals and Health Systems (OAHHS), is committed to providing governance and support to the Oregon Health Network throughout the planning and implementation of the FCC pilot project.

Biographical Sketches OHN Leadership Committee/Founding OHN Board of Directors

Jo Bell

Jo Bell is a government relations and project manager for healthcare, healthcare workforce issues and efforts as well as a provider of support services for miscellaneous government relations functions. She served as Acting Executive Director, Oregon Healthcare Workforce Institute, from March 1, 2006 to September 30, 2006 and Shared Executive, Healthcare Workforce Initiative, Office of the Governor/Oregon Association of Hospitals & Health Systems from   September 1, 2005 to February 28, 2006. She was Director, Legislative Support Services, Oregon Association of Hospitals and Health Systems from January 1, 1992 to March 1, 2006. Her memberships include: the Board of Directors, Oregon Healthcare Career Center; Governing Council, Oregon Simulation Alliance; Board Member, Treasurer and Former Secretary, Telehealth Alliance of Oregon; Capitol Club, member 20 years; Steering Committee, Community College Healthcare
Action Plan (CCHAP).

Agnes Box

Agnes Box, Telecommunications Coordinator at the Oregon Institute of Technology (OIT) in Klamath Falls, has a 30-year history in academic computing environments, the past 12 years focused on telecommunications technologies and services. Box holds a Bachelor of Science in Industrial Management from the Oregon Institute of Technology, and a Masters in Business Administration from Southern Oregon University. Box has been an active voice for access to advanced services in rural and underserved communities since 1995. She currently serves in leadership positions representing OIT on the Klamath Falls Telecommunications Task Force and represents the task force on both the Regional Fiber Consortium and Oregon Rural Telecommunications Coordinating Council. Box is serving her second term as Vice-Chair of the Regional Fiber Consortia and is in her second term as a member of the Oregon Rural Telecommunications Coordinating Council (ORTCC). In 2006, Governor Ted Kulongoski reappointed Box to a four-year term, ending in 2010. She is an active member of the ORTCC Health Education subcommittee. In 2005, Box was recognized for *efforts, accomplishments and contributions to telecommunications in Oregon*, receiving the *Excellence in Telecommunications Partnerships Award*, at the annual Oregon Connections Conference, in Bend, Oregon.

Catherine Britain

Catherine Britain is the Telehealth Program Manager for Asante Health System in Medford Oregon. She is responsible for developing and coordinating all telehealth activities for Asante. Catherine also runs Rodeo Net Consulting. She provides support to organizations and communities who want to build

telehealth networks, and develop applications. Additionally, Rodeo Net Consulting offers telehealth policy development and grant writing for telehealth projects. Previously she was the program director for RODEO NET, a tele-mental health program based in La Grande, Oregon for 10 years. Catherine has been active in regional, state and national groups that promote rural mental health, rural telecommunications and telehealth. Among them the Association of Telehealth Service Providers and the American Telemedicine Association, the Board of the National Association for Rural Mental Health, and the Oregon Telecommunications Coordinating Council. She is a co-founder and the immediate past president of the Telehealth Alliance of Oregon.

Andrew S. Davidson

Andrew S. Davidson has been President and CEO of the Oregon Association of Hospitals and Health Systems (OAHHS) since November 2005. OAHHS is a member driven association that provides healthcare policy and advocacy leadership for all of Oregon's 57 acute care hospitals and health systems.

Under his leadership, OAHHS has embarked on an organization-wide strategic planning process which includes an on-going statewide "listening campaign" to solicit input from other health care organizations, elected officials and community leaders around our state's healthcare challenges and opportunities.

Andy has a unique depth of experience garnered from leadership positions held with other associations, as well as public and private sector entities. Prior to joining OAHHS, Andy spent several years as the director of the software products division for a health care information technology company. Andy's association management experience comes from five years on the executive team at the Washington State Hospital Association, where he was the Vice President of Government and Public Affairs. He has also served as health care policy advisor to a senior member of the United States Congress, has run a successful Congressional campaign and worked for the Maryland State Legislature. What many people don't know is that Andy is also an entrepreneur at heart, having been the COO of software start up during the .com boom and also as the owner of a regional franchise for Ben and Jerry's ice cream in the Pacific Northwest in the early 90s.

Andy currently sits on the board for Acumentra Health, is co-chair of the Integrated Health Resource Services Administration (HRSA) Oversight Committee, is a member of the Cabinet of the United Way of the Columbia-Willamette and is currently leading collaborative efforts with Oregon health care competitors to improve community health as Chair of Oregon Health Systems in Collaboration [OHSIC].

Andy received his B.A. in English and Irish Literature at the University of New Hampshire and was a participant in the first Executive Leadership Symposium on Health Care Policy and Reform at Harvard's Kennedy School of Government. Mr. Davidson resides with his wife, Margot, and their three children in West Linn, Oregon.

Jon Dolan

Jon Dolan is a 38-year-old native Oregonian and the Associate Director for Network Services at Oregon State University. Jon holds a bachelor's degree in Mathematics from Oregon State and has worked for the University for 18 years serving in various Information Technology positions. As Oregon's land grant institution and a charter member of Internet2, OSU directly delivers IT services to all 36 Oregon counties and is connected at leading edge speeds to the national research backbone. As Associate Director, Jon leads groups of engineers responsible for the University's Internet and Internet2 connections, data and telephone services, core network applications such as the University's Email system, and the University's Open Source Lab which is helping to lead the global Open Source Software movement by hosting among other things Mozilla Firefox, Apache foundation software, and the master Linux Kernel.

Robert Duehmig

Robert Duehmig is currently the Communications Director for the Oregon Office of Rural Health (ORH). The ORH is based at Oregon Health & Science University (OHSU), Oregon's only medical research university. Previously, Duehmig worked as the Associate Director of Government Relations for OHSU from 2000-2006. Prior to coming to OHSU, he worked in the office of Congressman David Wu, handing issues dealing with education, business and labor and rural coastal issues. Duehmig worked for the American Federation of Teacher-Oregon for six years as the Director of Government Relation. He handled issues dealing with healthcare, K-12 education, Community Colleges and university faculty. From 1991 – 1992, Duehmig worked in the end user marketing division of Avnet Computer in Culver City California. Prior to coming to California, Duehmig worked as an Education Advisor for the US-UK Fulbright Commission. The Commission was the academic advising arm for the US Embassy in London.

Scott Ekblad

Scott Ekblad began his career in health care as a health educator in a community-based AIDS service organization, where he was the Director of Education. He then moved to a health education position at the Oregon Health Division, organizing new community-based service organizations around the state. Scott came to the Oregon Office of Rural Health in 1992, where he has managed various programs and, most recently, became director of the office in 2005. Scott was a founding board member of the National Rural Recruitment & Retention Network and served several terms on the board of directors of the National Organization of State Offices of Rural Health. He is currently on the Oregon Primary Care Association's board of directors, the National Rural Health Association's Board of Trustees and NRHA's Rural Health Policy Board.

Robert C. French

Robert French began his career in information technology in the early 1960's and has participated in the technology changes in healthcare during most of that time. He has developed and implemented systems in a technical and managerial capacity in several major healthcare organizations. He has served as Chief Information Officer with Providence Health Systems, first at St. Vincent Hospital in Portland, Oregon and again in the Olympia, Washington based Southwest Washington Service Area. He has held similar positions at Legacy Health System, Kaiser Permanente, and Intermountain Healthcare. He has served as a Sr. Consultant for Electronic Data Systems (EDS) and Certus Corporation, holds a Bachelor of Science degree in Computer Science and is currently serving as the Corporate Vice President and Chief Information Officer for Samaritan Health Services in Corvallis, Oregon.

Arthur J. Hill

Art Hill is Vice President, Customized Training, Blue Mountain Community College. He is responsible for workforce development and three Small Business Development Centers at Blue Mountain Community College, with a service area of over 18,000 square miles in rural eastern Oregon.

Since earning his M.B.A. in Finance, Art has worked with a variety of companies from Fortune 100 to his own Argo Resources. He is Chair of the Region 12 Workforce Response Team and of the Pendleton Progress Board. He represents community colleges as a Governor's appointee to the Oregon Telecommunications Coordinating Council and the Oregon Workforce Alliance.

Art was instrumental in bringing one of 11 allied health programs to BMCC, a distance education degree program for Medical Technicians offered in collaboration with Wenatchee Valley College in Washington State. He participated in the statewide planning and acquisition of nursing education simulation labs, and

served on a task force to define nursing education telehealth applications at the request of state Senator David Nelson.

Art currently serves as a member of the Leadership and Business Plan committees for the Oregon Health Network.

Kim Hoffman

Kim Hoffman is currently the Outreach and Telehealth Coordinator for the Information Technology Group (ITG) at Oregon Health & Science University (OHSU). After attending Southern Oregon University, Kim began her career at OHSU in 1976 in the Patient Business Office. In 1985, she joined the Hospital Information Systems Department (HISD) to assist with the implementation of the SMS (Shared Medical Systems) patient and clinical management systems. After taking on the role of Interim Director for HISD in 1988, she served as the Applications Manager for HISD until 1993 when the hospital and university systems groups merged to become the Information Technology Group. Kim served as Interim CIO for OHSU in 1990, and again in 1995, and then became the Director of Applications for ITG until 1999, when she moved into her current position. Kim currently participates as an ex-officio member of the Oregon Telecommunications Coordinating Council (ORTCC), serves on the Health-Education Committee of the ORTCC, and is the current chair of the Telehealth Alliance of Oregon (TAO).

John Irwin

John Irwin helps communities use technology for economic improvements as well as for quality of life enhancements. John chairs the Oregon Telecommunications Coordinating Council (ORTCC). Boards of director affiliations include the Area Health Education Center (AHEC) of southwest Oregon, the Telehealth Association of Oregon (TAO), and the Southern Oregon Telecommunications & Technology Council (SOTTC). He brings many years of diverse information technology experience gained from contributions in the public and private sectors. Current projects include working with rural communities to build 21st century information age communities as well as to develop community-based chronic disease self-management programs.

Paul Matthews

Paul Matthews has been Chief Technology Officer, OCHIN since 2003. He was educated in England, majoring in Communications Engineering. He has 20 years of experience consulting in information systems extensively on large-scale network implementations in Europe, the Middle East, Asia, and here in the U.S. and was the principal architect of OCHIN's current infrastructure. He served 13 years with the British Military including tours with NATO, Allied Command Europe Communications Security (ACE Comsec) and the NATO Communication and Information Systems School (NCISS).

Vanessa McLaughlin

Vanessa McLaughlin, MPH, is the Director of Health Care Innovations and Grants program at Providea, Inc. She has spent the first 20 years her career assisting many medium and large organizations develop strategic plans for their new program implementations. While completing her graduate studies Vanessa was named a Graduate Fellow for the regional Veterans Administration Health Care System. In this capacity Vanessa was asked to work with all regional facilities to learn and understand how the organization delivered educational services to their employees and to patient groups with chronic health issues. This process lead Vanessa to the VA in Alaska (1997) where she began to learn about how remote

markets dealt with administrative staff and patient groups training. In 1997 Vanessa was hired to develop a 5 state Telemedicine program for the VA system. This project again started in Alaska with the then developing AFHCAN (Alaska Federal Health Care Alliance Network). The VA supported this infant project with a $1million dollar grant from the Telehealth program.

This opportunity provided Vanessa the challenge of how to establish a broadband network across state lines, across oceans and then into terrain that was possible to traverse. This was her introduction to how technology implementations *really* work in Alaska. This experience allowed her to develop a tremendous understanding of the Alaskan culture, to meet and develop relationships with many of the key technical leaders in the state as well as state government members responsible for the overhaul of the states network.   Her love for the state and her understanding of remote training and education issues lead her to begin important work with School systems across the state. Again discovering four years ago that funding for new educational programs is limited Vanessa began to work with grant programs to identify how these funding sources would best support the technical needs of the school programs. Currently programs have been funded for over $10 million dollars through these efforts.

Vanessa works for Providea, Inc a videoconference integration organization based in Camarillo, California. She serves on the board of the Vancouver School District Foundation, Washington State. She is currently serves as chair-elect Industry Council for the American Telemedicine Association, is a member of Leadership Council for the Oregon Health Network. Vanessa is asked to regularly meet with video manufacturers, Polycom and Tandberg to advise on product development for the health care environment.

Rob Myers

Rob Myers is the owner of R.E. Myers & Associates, a consulting and lobbying firm he operates from his home in Condon, Oregon. His primary areas of professional interest, activity and advocacy include frontier rural telecommunications, telehealth, education, renewable energy, transportation, agriculture and economic development. He is a member of the Oregon Telecommunications Coordinating Council, the Telehealth Alliance of Oregon board of directors, the Partnership Committee of the Oregon State Interoperability Executive Council, the Eastern Oregon Telecommunications Consortium board of directors, the Association of Oregon Counties' Interoperability Task Force, the Eastern Oregon Rural Alliance and is a Gilliam County Port Commissioner. He is also the manager and Executive Director of Frontier TeleNet, which over the past eight years has constructed a wireless broadband network providing telecommunications connectivity and capacity for law enforcement, public health, education and emergency services across nearly 15,000 square miles of frontier rural Eastern Oregon.

Sandra Olson

Sandra Olson has thirty years experience in the health and health education industry. For ten years, Ms. Olson served as Director of a two county medical clinic service in the San Francisco Bay Area. For the ten years following, Ms. Olson was both founder and CEO of a national school-based health education center, which became the largest multi-disciplinary school-based prevention education organization in the country. This education center was comprised of a multimillion-dollar health education publishing arm, serving thousands of secondary level and university based health education instructors. Importantly, this company's research division employed over thirty doctoral level researchers who individually and collectively established some of the pioneering studies in HIV and other areas of school-based prevention education. Additionally, this health education center held both state and federal contracts for clearinghouse functions, including those for such discrete health areas as HIV prevention and smoking cessation. Finally, this health education organization served as a national training center for health education teachers, which, over a ten-year period, provided intensive teacher and trainer education

training programs for state departments of education and local school districts in all fifty states, as well as Guam and Puerto Rico, preparing thousands of teachers nationally as health education instructors.

For the last eight years, Ms. Olson has worked for the Asante Health System in southern Oregon where she serves as Director of Research and Development. During her tenure at Asante, Ms. Olson has developed and served as grant administrator for federal grants and contracts in the areas of technology and telehealth, totaling over sixteen million dollars of federally funded programs. Collectively, Ms. Olson has administered more than seventy-five million dollars of private and publicly funded health related grant programs and services. Ms. Olson's experience in the administration of federal grant and loan programs lends an important expertise to the Leadership Committee of the OHN.

Edwin B. Parker

Edwin B. Parker is President of Parker Telecommunications, a consulting business located in Gleneden Beach, Oregon, since 1989. Previously, Parker had been President of the Data Networks Division of a large telephone company, a unit that included the former Equatorial Communications Company. Parker had co-founded Equatorial in 1979, helped it grow from an entrepreneurial idea to a public company, and was its Board Chairman, President and Chief Executive Officer prior to its merger with Contel in 1987. From 1962 to 1979 Parker was a professor of Communication at Stanford University, where he specialized in the social and economic effects of information technology. He taught at the University of Illinois from 1960 to 1962. He has co-authored or co-edited five books and more than 75 professional articles. The second edition of his latest book, *Electronic Byways: State Policies for Rural Development through Telecommunications*, was published by the Aspen Institute in 1995. An earlier book, titled *Rural America in the Information Age: Telecommunications Policy for Rural Development,* was published in 1989 by University Press of America. He graduated from the University of British Columbia and received his Ph.D. from Stanford University. Parker is chair of the CoastNet committee of the Economic Development Alliance of Lincoln County. Oregon Governor John Kitzhaber named Parker local economic development leader of the year in 1995. Parker represented the Oregon coast on the Connecting Oregon Communities Advisory Board. He has served on the Oregon Telecommunications Coordinating Council since its inception and was recently reappointed by Governor Ted Kulongoski to a new four-year term ending in 2010. He is a member of the board of the Telehealth Alliance of Oregon. He was named Man of the Year in Lincoln City in 2006 in recognition of his local contributions to telecommunications and economic development.

Jody Pettit, MD

Dr. Pettit is working in a dual role regarding health IT in Oregon. She was selected by the Oregon Office of Health Policy and Research to serve in the role of Health Information Technology Coordinator. She is a Board-Certified Internist practicing part-time as faculty with the Department of Medical Education at Providence Ambulatory Care and Education Center, the Department of Medicine Faculty Practice at St. Vincent's and with Legacy Health Systems in Portland.
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She was the Medical Director of the InterHospital Physicians Association (IPA) in Portland, Oregon from 2001-2005. Dr. Pettit worked in the role of clinical consultant for the electronic health records company MedicaLogic in Hillsboro, Oregon from 1999 - 2001.

She is a Clinical Assistant Professor at the OHSU Department of Medical Informatics and Clinical Epidemiology. She has been on the Board of the Oregon Healthcare Quality Corporation (QCorp) since 2001 and served as the Chairperson of the Chronic Disease Data Clearinghouse. Dr. Pettit served as Chair of the Electronic Health Records and Healthcare Connectivity Subcommittee for the State of Oregon, under the Oregon Health Policy Commission 2005.

She is the Project Director for the Oregon Health Information Security & Privacy Collaboration. She is on the Board of the Oregon Chapter of the Healthcare Information Management Systems Society (HIMSS), as RHIO Federation Liaison. She participated in the State of Oregon Evidence-based medication review process in 3 subcommittees, acting as Chairperson of the Triptan subcommittee. She earned her Medical Degree from Medical College of Virginia and a Master's Degree in Health and Wellness Administration and a BS in General Science from the University of Iowa.

Link Shadley

Link Shadley was born and raised in the Hood River Valley and in 2006 began working in The Dalles with the Mid Columbia Economic Development District (MCEDD) to develop economic development programs that use telecommunications and other technology for that rural region. Link returned to Oregon in the early 90's and found there was no local Internet access in Astoria. He joined with other like minded technoevangelists to help Oregon EdNet establish local dial-in access in Astoria, Seaside and Jewell; worked for and with Clatsop Community College to create the Community Information Center Internet training lab; joined statewide efforts to improve telecommunications in Oregon which resulted in the passage of Senate Bill 622 and then became a temporary bureaucrat to help administer this $120 million dollar program. Link then joined Oregon State University (OSU) as the Continuing Education & Outreach Programs Manager to focus on two areas at Extended Campus: 1) the creation of the Oregon Virtual Tribal College which will be a new Land Grant college owned by the 9 recognized Tribes in Oregon and 2) the creation and management of workforce development and other non-credit courses by combining the resources at OSU with the talent of Extended Campus to deliver classes online. Link also has served as a member of the Oregon Telecommunications Coordinating Council (ORTCC) since 2001 and is the current Vice Chairman.

Donald Skinner

Donald Skinner is currently the Executive Director of Oregon Pacific Area Health Education Center located in Lincoln City, Oregon. His background over the past twenty-five years has been in Community organizing and working on issues directly related to community health and wellbeing. He has served on the boards of numerous community organizations and worked as Executive Director and Development Director as well as Public Affairs Manager in his professional career. Policy governance and community relations are his specialty areas.

Before taking on Oregon Pacific AHEC, Don served as the Development Coordinator for North Lincoln Hospital Foundation. In this capacity he became well acquainted with both the problems and emerging opportunities in rural healthcare. He also worked closely with community groups such as CHIP (Community Health Improvement Partners) and ORPRN (Oregon Rural Practice-based Research Network) to find creative solutions to longstanding local healthcare challenges such as rural transportation issues, chronic care delivery, and integration of electronic communication options in healthcare systems.

His academic training includes Divinity School from Yale University and a BA in history.

Ann Steeves

Ann Steeves is Regional Coordinator, Oregon HRSA Region 2. Ann has held managerial positions in governmental agencies in both state and municipal arenas, including the development and implementation of Information Technology and Geographic Information System solutions in two municipalities implementing Global Positioning System technology. She has 20 years experience in government

finance, procurement, and operational management, including financing large capital and IT projects, and is a certified network administrator and software instructor. She has successfully applied for and administered many grant programs from private, state, and federal sources. Ann also has worked for the Department of Defense and has held a Top Secret security clearance while doing work for the U.S. Navy in and around the Pentagon.

As the Founder of the Oregon Security Institute (OSI), Ann built a community collaborative model to address Homeland Security issues specifically from a rural perspective. The OSI collaborative crosses agency and industry boundaries and includes both public and private sector partners. Ann leveraged support and worked with the first responder agencies in the area to host the State of Oregon's first seven-county Homeland Security Summit in February 2002 in partnership with Oregon Emergency Management, the MITRE Corporation (McLean, Virginia), and county emergency managers. Multiple agencies including Hospitals, Public Health, Ambulance Providers (EMS), Police, Fire, HAM Radio Operators, and others came together to share their readiness efforts and to begin to define their collective needs. Ann has worked with the Oregon Coastal Zone Management Association (OCZMA) to assist in evaluating the security needs of our coastal ports and recently facilitated the State Earthquake/Tsunami Summit and Exercise held in March 2005. Ann has participated as a speaker or panelist at the League of Oregon Cities conference (2002); the Critical Infrastructure Assurance Office (CIAO) and Western Governor's conference in Las Vegas, NV (2002); the Western Community Policing Center conference in Las Vegas, NV (2003); the Governor's State Interoperability Executive Council (2003-2007); the Oregon Governor's OSHA conference (2007); and numerous telecommunications conferences (2002-2004). Ann has met with primary advisors of the Bush Administration including John Tritak (CIAO) and Richard Clarke (Special Advisor to the President and National Crisis Coordinator) to discuss the needs of public safety agencies in Oregon.

Ann was appointed to the Oregon Telecommunications Coordinating Council and elected Vice Chair in 2004. She was one of the primary authors of HB2304, which established State policy for public safety networks and created outreach to private sector providers to ensure sufficient redundancy, and route diversity will exist for emergency management communications. In May 2003, in partnership with over 20 agencies and private sector partners Ann worked to develop and implement a two-day, full-scale bioterrorism exercise based on small pox known as Oregon SHIPS (Strategic Homeland Initiatives Program Support). From August 2005 through March 2006 Ann served as an Incident Commander in the Command Center of Samaritan Health Services working in partnership with the US Surgeon General's Office and was responsible for coordinating the deployment of eleven Mobile Medical Strike Team missions comprised of volunteer physicians, nurses, pharmacists, and behavioral health specialists.

XIV. CLOSING COMMENTS

Oregon is a state rich in natural resources and scenic vistas of mountainous terrains, pristine picture perfect lakes and an almost infinite ocean that fills the western horizon. Oregon's rural citizenry is the proud beneficiary of much of this natural wealth. The peculiar irony of having some of the most beautiful locales on the planet while facing an absence of basic healthcare services has not been lost for a moment on those who have made a commitment to the Oregon Health Network project.

A chronic shortage of healthcare professionals in Oregon's rural communities compounded by an uncertain economic base can severely limit options for what is often a low income or underemployed rural work force. Oregon's agriculture, timber, fishing and tourist industries all rely on an industrious labor pool that suffers from circumstances that can result in the need for emergency health care. An increased retired and aging populace that threatens to stretch healthcare resources well beyond the breaking point further complicates this rural reality.

The Oregon Health Network and the FCC project it seeks to implement is a relationship that would clearly serve the public health and welfare. The invitation to this opportunity to develop a model for improving the basic quality of rural health care has been an exciting challenge. We have worked to develop a realistic business plan with concrete financial commitments and a practical organizational process. The vision of a seamless telecommunications network has already taken root.

The basic backbone telecommunications infrastructure is already in place. The capital investment to complete middle and final mile connections awaits just such an opportunity as this. The primary healthcare systems and their technical staffs have given the go ahead to the OHN and see this not only as a chance to expand their individual outreach but also as a unique framework in which to increase their combined impact by developing cooperative venues and applications.

The OHN leadership team, through the Oregon Association of Hospitals and Health Systems (OAHHS) and the Telehealth Alliance of Oregon (TAO), has made the commitment to take whatever steps are necessary to honor the hopes and dreams that have become invested in realization of the Oregon Health Network. We enthusiastically embrace partnering with the FCC to make the OHN a reality in Oregon.

XV. APPENDICES/ATTACHMENTS

A.   Senate Joint Resolution 20

B.   List of Potential Software Tools

C.   Letters of Support
   1. Governor Theodore R. Kulongoski
   2. Congresswoman Darlene Hooley
   3. Congressman David Wu
   4. Senator Ron Wyden
   5. Senator Gordon Smith
   6. Congressman Earl Blumenauer
   7. Representative Peter DeFazio
   8. Congressman Greg Walden
   9. Douglas E. Van Houweling – Internet2
   10. David Crowe, Jr. – University of Oregon

D.   Maps
   1. Hospitals
   2. Rural hospitals
   3. Rural Health Clinics

E.   OHN Infrastructure Committee – Request for Information

F.   Oregon Health Network Waiver Requests to the FCC

Attachment A
Senate Joint Resolution 20

Enrolled

Senate Joint Resolution 20

Sponsored by Senators MONNES ANDERSON, NELSON (at the request of Oregon Telecommunications Coordinating Council)

Whereas health care telecommunications networks in Oregon are not able to seamlessly interconnect with each other; and

Whereas it is becoming increasingly important to move health information, not patients; and

Whereas the health care and education communities are jointly involved in health care workforce education; and

Whereas health care and education telecommunications networks in Oregon are not able to seamlessly interconnect with each other; and

Whereas there is a need for quality of service levels for all health care and education networks in Oregon; now, therefore,

Be It Resolved by the Legislative Assembly of the State of Oregon:

The members of the Seventy-fourth Legislative Assembly:

(1) Declare that it is the policy of the State of Oregon to promote and facilitate activities by Oregon's health care and education communities and their telecommunications providers to develop a network model that provides standards for interoperability, establishes a peering point for all health care and education telecommunications in Oregon and establishes peering agreements among health care and education networks that contain payment structures.

(2) Encourage the Oregon Telecommunications Coordinating Council Health-Education Committee, in collaboration with the Telehealth Alliance of Oregon, to:

(a) Work with the health care and education communities and telecommunications providers to develop a telecommunications network model consistent with policy adopted in this resolution;

(b) Report biennially to the Legislative Assembly on progress in developing a telecommunications network model consistent with policy adopted in this resolution; and

(c) Propose any legislation necessary to implement a telecommunications network model consistent with policy adopted in this resolution.

Adopted by Senate March 5, 2007

_____

Secretary of Senate

_____

President of Senate

Adopted by House April 16, 2007

_____

Speaker of House

Attachment B
List of Potential Software & Tools

Tool	Vendor	Target Metric	Enabling Mechanism	Tool Location	Why measurement is required
SmokePing	Open source	Latency, Latency distribution, Packet loss	CGI scripts measure latency for various network protocols	Probes would be placed at various statewide NAP, and LSP locations	Synchronous applications (voice/video) need small and consistent latencies (jitter)
SAA/SLA	Cisco	Latency, Latency distribution, Packet loss	Proprietary	Router IOS SAA/SLA agents would be placed at various statewide NAP, and LSP locations	Synchronous applications (voice/video) need small and consistent latencies (jitter)
Iperf/NetPerf	Open source	Latency, bandwidth, packet loss	Scripts	Probes would be placed at various statewide NAP, and LSP locations	Used primarily for troubleshooting
Cricket/Cacti	Open source	Switch/router/server performance	SNMP polling	Tool at NOC, but accessible from anywhere	Capacity planning and troubleshooting
Nagios	Open source	Network fault management	ICMP, SNMP traps	Tool at NOC, but accessible from anywhere	Notification of real time network faults
Sniffers	Various	Bit level decodes of network traffic	N/A	Sniffers would be placed at various statewide NAP, and LSP locations, accessible via VNC or other mechanism	Used primarily for troubleshooting
Trouble ticketing	Various	N/A	N/A	Tool at NOC, but accessible from anywhere via VNC or other mechanism	
ADSM	Cisco	Management of CPE VPNs/firewalls	Proprietary, Java-based	Tool at NOC, but accessible from anywhere via VNC or other mechanism	

Tool	Vendor	Target Metric	Enabling Mechanism	Tool Location	Why measurement is required
CVS	Open source	Router/switch configuration management		Tool at NOC, but accessible from anywhere via VNC or other mechanism	
Netflow analysis, eg flowtools, cflowD, etc	Open source	Traffic analysis, virus detection		Tool at NOC, but accessible from anywhere via VNC or other mechanism	Used primarily for troubleshooting
Bandwidth Test Control Tool	Open source/ Internet2	Application and a scheduling and policy daemon that wraps Iperf and Thrulay			
One-Way-Ping OWAMP	Open source/ Internet2	Used to determine one way latencies between hosts			
Network Diagnostic Tool	Open source/ Internet2	Provides network configuration and performance testing to a user's desktop or laptop computer			
Thrulay	Open source/ Internet2	Used to measure the capacity, delay, and other performance metrics of a network by sending a bulk TCP or UDP stream over it			
Network Performance Toolkit	Open source/ Internet2	Downloadable, pre-configured collection of network performance tools, including NDT, BWCTL, OWAMP, Thrulay and others			

Tool	Vendor	Target Metric	Enabling Mechanism	Tool Location	Why measurement is required
perfSONAR	Open source/ Internet2	Infrastructure for network performance monitoring, making it easier to solve end-to-end performance problems on paths crossing several networks			
OpenSAML	Open source/ Internet2	Assists an application wishing to use SAML messages or standard SAML profiles to express and carry security information between software components and systems			
Shibboleth	Open source/ Internet2	Standards-based middleware software which provides Web Single SignOn (SSO) across or within organizational boundaries. It allows sites to make informed authorization decisions for individual access of protected online resources in a privacy-preserving manner.			
Grouper Group Toolkit	Open source/ Internet2	Enables a consolidated way to automate or enable a delegated manual management of groups and related membership			

Tool	Vendor	Target Metric	Enabling Mechanism	Tool Location	Why measurement is required
Signet Privilege Management System	Open source/ Internet2	Integrates with group management systems to provide privileges to groups as well as individuals			

C.   Letters of Support
1. Governor Theodore R. Kulongoski
2. Congresswoman Darlene Hooley
3. Congressman David Wu
4. Senator Ron Wyden
5. Senator Gordon Smith
6. Congressman Earl Blumenauer
7. Congressman Peter DeFazio
8. Congressman Greg Walden
9. Douglas E. Van Houweling – Internet2
10. David Crowe, Jr. – University of Oregon

THEODORE R. KULONGOSKI
Governor

May 1, 2007

Federal Communications Commissioners
Attn: Kevin J. Martin, Chairman
Federal Communications Commission
445 12th St. SW
Washington, DC 20554

Dear Commissioners:

As Governor of the State of Oregon, I am pleased to express my support for the accompanying proposal for the FCC Rural Health pilot project. This proposal to create the Oregon Health Net has the potential to revolutionize access to quality healthcare in our state by connecting all of Oregon's rural communities in one seamless regional information web. This project is a hallmark of the FCC's commitment to forward thinking and readiness to invest in the unfolding future of our nation's communications network and offers great opportunity to help Oregon move forward.

A key goal of my administration has been a commitment to Oregon's economic and social development with efforts to improve the economic status of Oregon by enhancing the welfare and well-being of all the State's communities and residents. The singular impact of this pilot project would exponentially augment the quality of life for Oregon's rural communities, securing a foundation that in turn would enable communities to maintain sustainable livelihoods while developing integrated economies.

The importance of appropriate, timely and high quality healthcare services for rural Oregonians in their local communities cannot be overestimated. A large population of senior citizens in most of these rural communities is a driving impetus for innovative approaches to address critical healthcare concerns. Traveling to receive either basic or specialist care often is not a realistic option, leaving these most vulnerable citizens with minimal provisions or no healthcare services whatsoever. A telecommunications infrastructure with sufficient real-time connectivity to access much needed services will dramatically improve the quality of life of these rural senior residents.

A cornerstone of my overall economic goal for Oregon has been ensuring that our work force can access the education and training needed to upgrade their skills and fill professional positions that provide viable family wages. Oregon's healthcare work force not only has expanding unmet needs but also these jobs are an excellent engine for providing an

economic infusion into rural communities. There remains a crying need for healthcare professionals in rural areas that have historically had problems attracting and keeping healthcare workers.

A strategic goal that Oregon has embraced to address this need for healthcare providers requires the availability of educational and training opportunities to residents statewide. Empirical data confirms that once Oregon's rural residents leave their communities to pursue education or training, they rarely return. Oregon Health Net affords an expanding horizon of training and educational opportunities in the familiar surroundings of rural hometown communities. Critical access to quality healthcare and education is the lifeblood that sustains Oregon's rural communities. For too long we have lost vital talent and energy from our rural regions into an ever-expanding urban pool. The Oregon Health Net is a dramatic step in the direction of re-balancing this urban-rural equation.

I am impressed by the FCC's readiness to make an investment of this scale and to apply a resource of this magnitude to improve the healthcare prospects of rural communities. Oregon is primed to maximize this significant investment of federal funding to secure not only the future of rural healthcare but also to engage in preparing our state to provide leadership, expertise and readiness for the demands and expanded opportunities that accompany this new communications era.

Thank you for your consideration of this important proposal.

Sincerely,

THEODORE R. KULONGOSKI
Governor

TRK:rs:gv
c: Sarah Bittleman, Director of Federal Affairs

DARLENE HOOLEY
5th DISTRICT, OREGON

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TOLL FREE: 1 888 4-HOOLEY

April 26, 2007

The Honorable Kevin Martin, Chairman
Federal Communications Commission
445 12th Street, SW
Washington, DC

RE: Rural Health Care Pilot Program Application
       Oregon Health Network
       State of Oregon

Dear Chairman Martin:

I am writing to express my support for the application filed by the Oregon Health Network (OHN), under the Rural Health Care Pilot Program.

This visionary proposal will create the Oregon Health Network, a digital broadband network of networks that would securely and privately interconnect all Oregon hospitals and clinics, for the provision of telehealth services. In addition, the network would connect to the state and county public health offices and educational institutions that provide training for health care professionals.

The network would interconnect with both the Internet and Internet2 to reach relevant sites on those networks. The proposal includes inter-operability with public safety networks to coordinate disaster planning and response. Other connections will include health insurers, pharmacies, along with secure access via the Internet for authorized users such as clinicians on-call and home health monitoring.

The Oregon Health Network has four primary goals that will guide the development of their network; 1) The State of Oregon will achieve significant advances toward parity in its health related services across its urban, suburban and rural regions through the deployment of the OHN as an independent member organization; 2) The proliferation of successful telehealth applications across Oregon's most underserved areas will be attained through the active involvement of rural stakeholders, and a comprehensive program of education and technical support of rural network users; 3) The active and ongoing participation of rural providers in telehealth applications will be

sustained by a sliding scale fee system; and 4) OHN will establish a statewide broadband network and network applications that improve access to and quality of care in Oregon, as well as participate in development of a national health network that more fully serves the health care needs of all U.S. citizens.

The vision for the OHN is easy to state, but difficult and costly to implement in a rural state like Oregon where more than 50.3% of the land mass is federally owned, operated, and not an active element of the state's economic viability. Funding from the FCC Rural Health Care Pilot Program will assist in reducing the cost component of this equation. The wisdom, commitment and aspirations of a multidisciplinary Oregon leadership group will address the infrastructure and geography components.

The vision of this network is shared by the Oregon Association of Hospitals and Health Systems (OAHHS) and the Telehealth Alliance of Oregon (TAO). The OAHHS is comprised of 71 member hospitals and healthcare systems including a strong component that represents the small and rural hospitals in Oregon. The OAHHS collectively serves more than one million Oregonians. The TAO is a volunteer organization. Its members represent countless years of telehealth expertise and leadership. Together OAHHS and TAO have drawn together more than 150 organizations and individuals who share in the mission of this first critical step toward building a national healthcare highway – the Oregon Health Network. Collectively, this leadership group will speak to the challenges of a rural, significantly underserved Oregon population, and respond with both an infrastructure and vision toward an improved health and well being for all Oregonians.

In closing, I want to commend you for establishing this pilot program and opening the door for the FCC Commission to re-examine the rural health care (RHC) universal service support program. In particular, I am pleased that the FCC Commission has significantly expanded the scope of the RHC under this pilot to encourage infrastructure investment and the deployment of dedicated networks. This is a badly needed expansion beyond the current very limited scope of the existing RHC program. I encourage you to revise the existing program with an expansive range of eligibility as you have done in the pilot program.

Thank you in advance for considering this very important application.

Sincerely,

DARLENE HOOLEY
Member of Congress

DAVID WU
1ST DISTRICT, OREGON

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House of Representatives

Washington, DC 20515–3701

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FOREIGN AFFAIRS
TERRORISM, NONPROLIFERATION, AND TRADE

May 1, 2007

The Honorable Kevin Martin, Chairman
Federal Communications Commission
445 12th Street, SW
Washington, DC 20554

Dear Chairman Martin:

I am writing to express my support for the application filed by the Oregon Health Network (OHN), under the Rural Health Care Pilot Program.

This proposal will create the Oregon Health Network, a digital broadband network that would securely and privately interconnect all Oregon hospitals and clinics, for the provision of telehealth services. In addition, the network would connect to the state and county public health offices and educational institutions that provide training for health care professionals.

The network would interconnect with both the Internet and Internet2 to reach relevant sites on those networks. The proposal includes inter-operability with public safety networks to coordinate disaster planning and response. Other connections will include health insurers, pharmacies, along with secure access via the Internet for authorized users such as clinicians on-call and home health monitoring.

The Oregon Health Network has four primary goals that will guide the development of their network;

1) The State of Oregon will achieve significant advances toward parity in its health related services across its urban, suburban and rural regions through the deployment of the OHN as an independent member organization;

2) The proliferation of successful telehealth applications across Oregon's most underserved areas will be attained through the active involvement of rural stakeholders, and a comprehensive program of education and technical support of rural network users;

3) The active and ongoing participation of rural providers in telehealth applications will be sustained by a sliding scale fee system; and

4) OHN will establish a statewide broadband network and network applications that improve access to and quality of care in Oregon, as well as participate in development of a national health network that more fully serves the healthcare needs of all citizens.

The vision for the OHN is easy to state, but difficult and costly to implement in a rural state like Oregon where more than 50.3% of the land mass is federally owned, operated, and not an active element of the state's economic viability. Funding from the FCC Rural Health Care Pilot Program will assist in reducing the cost component of this equation. The wisdom, commitment and aspirations of a multidisciplinary Oregon leadership group will address the infrastructure and geography components.

The vision of this network is shared by the Oregon Association of Hospitals and Health Systems (OAHHS) and the Telehealth Alliance of Oregon (TAO). The OAHHS is comprised of 55 member hospitals and healthcare systems including a strong component that represents the small and rural hospitals in Oregon. The OAHHS collectively serves more than one million Oregonians. The TAO is volunteer organization. Its members represent countless years of telehealth expertise and leadership. Together OAHHS and TAO have drawn together more than 150 organizations and individuals who share in the mission of this first critical step toward building a national healthcare highway – the Oregon Health Network. Collectively, this leadership group will speak to the challenges of a rural, significantly underserved Oregon population, and respond with both an infrastructure and vision toward an improved health and well being for all Oregonians.

In closing, I want to commend you for establishing this pilot program and opening the door for the FCC Commission to re-examine the rural health care (RHC) universal service support program. In particular, I am pleased that the FCC Commission has significantly expanded the scope of the RHC under this pilot to encourage infrastructure investment and the deployment of dedicated networks. This is a badly needed expansion beyond the current very limited scope of the existing RHC program. I encourage you to revise the existing program with an expansive range of eligibility as you have done in the pilot program.

Thank you in advance for considering this very important application.

With warm regards,

David Wu
Member of Congress

GORDON H. SMITH
OREGON

United States Senate

WASHINGTON, DC 20510–3704

April 30, 2007

The Honorable Kevin Martin, Chairman
Federal Communications Commission
445 12th Street, SW
Washington, DC

Dear Chairman Martin:

I am writing to express my support for the application filed with the Federal Communications Commission (FCC) by the Oregon Health Network (OHN) to participate in the Rural Health Care Pilot Program.

The OHN proposal will create a digital broadband network that will securely and privately interconnect Oregon's hospitals, clinics, dental offices and optical centers for the provision of telehealth services. It will also connect state and county public health officials and educational institutions that provide training for health care professionals. In short, the OHN will establish a statewide broadband network and network applications that improve the quality of care in Oregon.

The OHN will be costly to implement in a rural state like Oregon where more than 50 percent of the state is federally owned and is not an active element of the state's economic viability. The OHN and the benefits that will accrue to rural Oregonians through its deployment might not otherwise be realized without funding from the FCC's Rural Health Care Pilot Program.

Thank you for establishing this pilot program to encourage infrastructure investment and the deployment of dedicated networks, and for considering this very important application.

Sincerely,

Gordon H. Smith
United States Senate

EARL BLUMENAUER
THIRD DISTRICT, OREGON

COMMITTEE ON WAYS AND MEANS
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May 2, 2007

The Honorable Kevin Martin, Chairman
Federal Communications Commission
445 12th Street, SW
Washington, DC

RE: Rural Health Care Pilot Program Application
        Oregon Health Network
        State of Oregon

Dear Chairman Martin:

I am writing to express my support for the application filed by the Oregon Health Network (OHN), under the Rural Health Care Pilot Program.

This visionary proposal will create the Oregon Health Network, a digital broadband network that would securely and privately interconnect all Oregon hospitals and clinics, for the provision of telehealth services. In addition, the network would connect to the state and county public health offices and educational institutions that provide training for health care professionals.

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of the state's tax revenue stream. Funding from the FCC Rural Health Care Pilot Program will assist in reducing the cost component of this equation. The wisdom, commitment and aspirations of a multidisciplinary Oregon leadership group will address the infrastructure and geography components.

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In closing, I want to commend you for establishing this pilot program and opening the door for the FCC Commission to re-examine the rural health care (RHC) universal service support program. In particular, I am pleased that the FCC Commission has significantly expanded the scope of the RHC under this pilot to encourage infrastructure investment and the deployment of dedicated networks. This is a badly needed expansion beyond the current very limited scope of the existing RHC program. I encourage you to revise the existing program with an expansive range of eligibility as you have done in the pilot program.

Thank you in advance for considering this very important application.

Sincerely,

Earl Blumenauer
Member of Congress

PLEASE RESPOND TO:

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PETER A. DeFAZIO
4TH DISTRICT, OREGON

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Congress of the United States

House of Representatives

May 2, 2007

The Honorable Kevin Martin, Chairman
Federal Communications Commission
Washington DC

Dear Chairman Martin:

Please note my support for the Rural Health Care Pilot Program application filed by the Oregon Health Network (OHN) to create a digital broadband telehealth network.

The OHN plans to connect all Oregon hospitals and medical, dental, and optical clinics. State and county public health providers and educational institutions involved in training for health care professions would be connected, as well. In addition, the OHN proposes inter-operability with public safety networks to coordinate disaster planning and response. Secure and private access is included for health insurers, pharmacies, clinicians, and other authorized users.

According to the OHN, the telehealth services network will help the state advance parity in health care services in urban, suburban, and rural areas; actively involve underserved rural stakeholders and provide comprehensive education and technical support to rural network users; improve access to care; and increase the quality of care in Oregon. OHN also plans to participate in the development of a national health network serving the health care needs of all U.S. citizens.

The Oregon Association of Hospitals and Health Systems and the Telehealth Alliance of Oregon will collaborate with the OHN to develop the state networks and a universal service support program. Their collective expertise is invaluable to the success of their shared mission to build a digital broadband health care highway.

Please give the Oregon Health Network application full and fair consideration.

Sincerely,

PETER DeFAZIO
Member of Congress

PAD:PJW

THIS STATIONERY PRINTED ON PAPER MADE WITH RECYCLED FIBERS

GREG WALDEN
Second District, Oregon
Deputy Whip

ENERGY AND COMMERCE

SUBCOMMITTEES:
ENERGY AND AIR QUALITY

TELECOMMUNICATIONS AND THE
INTERNET

OVERSIGHT AND INVESTIGATIONS

WEBSITE:
http://walden.house.gov
(E-Mail Available on Website)

Congress of the United States

House of Representatives

May 2, 2007

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1210 Longworth House Office Building
Washington, DC 20515-3702
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Toll Free: (800) 533-3303

Jamison Building
Suite 101
131 NW Hawthorne Street
Bend, OR 97701
Telephone: (541) 389-4408

The Honorable Kevin J. Martin, Chairman
Federal Communications Commission
445 12th Street, SW
Washington, DC   20554

Dear Commissioner Martin:

I am pleased to extend this letter of support for the Oregon Health Network's application to the Federal Communications Commission and its Rural Health Care Pilot program. OHN has developed and proposed a truly visionary, far-reaching network that will tremendously impact a vast, underserved rural Oregon and, in time, provide an outstanding resource for other areas in our nation.

OHN's project will create a digital broadband network of interoperable networks that will securely and privately connect all of Oregon's hospitals and clinics, including dental and optical clinics, for the provision of telehealth services. Additionally, the network will connect with state and county health and public safety offices, as well as educational institutions that provide training for health care professionals. The creation of such a network is vital for rural Oregonians, as healthcare issues present high levels of constant concern and difficulty.

The network's vision is impressively shared by a broad base of hospitals, systems and providers, all prepared to support and participate with this critical strategic advancement. I applaud such an extensive network of commitment, which includes the Oregon Association of Hospitals and Health Systems and the Telehealth Alliance of Oregon, and believe the OHN will realize outstanding success as a result.

I strongly encourage the FCC's consideration and support for the OHN application and project. If I can provide any other details or insight, please do not hesitate to contact me. Thank you.

Sincerely,

GREG WALDEN
Member of Congress

GW/dh

Internet2
Office of the President & CEO
1000 Oakbrook Drive, Suite 300
Ann Arbor, MI 48104
(734) 913-4250
(734) 913-4255 (fax)
www.internet2.edu

April 30, 2007

Jonathan Dolan
Associate Director of Network Services
Oregon State University
B211 Kerr Administration Building
Corvallis, OR 97331

Dear Mr. Dolan:

On behalf of Internet2, I am pleased to write in strong support of the proposal for the Oregon Health Network (OHN) that you are submitting to the Federal Communication Commission in response to the Rural Health Care Support Mechanism, WE Docket No. 02-60

This proposal's strengths include its:
- Inclusion of over 150 organizations and individuals (including the Oregon Association of Hospitals and Health Systems and the Telehealth Alliance of Oregon) working to connect a broad range of health care providers and the expansion of the statewide backbone to serve their needs;
- Use of Internet2's high bandwidth network to provide access to unmatched content and support;
- Effective partnership linking all Oregon hospitals, clinics, county public health offices, physicians, mental health, dental and optical clinics, and health education institutions;
- Interoperability with Oregon Public Safety and Emergency Management networks and statewide government and education networks; and
- Likelihood of achieving parity in health care services from urban to rural areas, providing vital links for disaster preparedness and emergency response, enhancing electronic information exchange and record-keeping, and cost-effectively improving statewide health care.

The proposal will utilize the new Internet2 Network and the regional networks to expand the telehealth infrastructure and provide high speed connections to all of its participants. By incorporating Internet2's middleware, security, and performance measurement tools, it also will provide secure exchange of medical records, permit remote access to expert diagnosis and treatment, increase cost-efficiencies by reducing costs associated with travel, and enhance training and research

collaboration with secure multi-site videoconferencing. The use of Internet2's network not only will provide an effective, secure, and system for statewide and national telehealth and telemedicine, but also will ensure that training and other integrated resources will be incorporated to optimize the network's utility. In doing so, the regional network that will be created will facilitate the exchange of reliable data, and digital image, voice, and video transmissions with quality to enhance real-time clinical consultation.

Internet2 is the foremost U.S. advanced networking consortium. Led by the research and education community since 1996, Internet2 promotes the missions of its members by providing both leading-edge network capabilities and unique partnership opportunities that together facilitate the development, deployment and use of revolutionary Internet technologies. The Internet2 Network and its member community innovations in middleware, security, educational networking, and partnerships with premier federal agencies such as NIH are uniquely positioned to deliver high performance, flexible, low-cost connectivity in support of healthcare needs on a sustained basis on the local, regional, state, and national levels. In the process, these partnerships are likely to expand technological capabilities, increase the range of geographical access to sophisticated treatment modalities, and redefine the parameters of disease diagnosis, treatment, and management.

We are pleased to offer our strong support for this innovative proposal, which will enhance the provision of telehealth and telemedicine services regionally and nationwide.

Sincerely,

Douglas E. Van Houweling
President and CEO, Internet2

UNIVERSITY OF OREGON

May 2, 2007

The Honorable Kevin Martin, Chairman
Federal Communications Commission
445 12th Street, SW
Washington, DC

RE: Rural Health Care Pilot Program Application
      Oregon Health Network
      State of Oregon

Dear Chairman Martin:

The Network for Education and Research in Oregon (NERO) is operated out of the University of Oregon and provides statewide high bandwidth in-state connectivity as well as access to the commodity Internet and to Internet2 for Oregon. NERO partners include all public Universities, many K-12 organizations in the state, many city and county governments, a number of Community Colleges, and the State of Oregon.

NERO partners provide a variety of online healthcare related services that would be available to the Oregon Health Network (OHN) community. Within Oregon's K-20 public education space, access is available to high quality online educational, training, continuing education and support resources. Also directly connected to NERO are state and federal emergency first responder services, city and county health departments, and other regional emergency management resources.

NERO has also offered to provide access to Internet2 for OHN to expand the reach of high quality, high bandwidth online services to national and international resources. Depending on the needs and final design of the OHN, NERO is also prepared to provide peering services at a minimum of two Oregon-based regional exchanges: Northwest Access Exchange (NWAX) in Portland and the Oregon Internet Exchange (OIX) in Eugene.

Sincerely,

David Crowe, Jr.
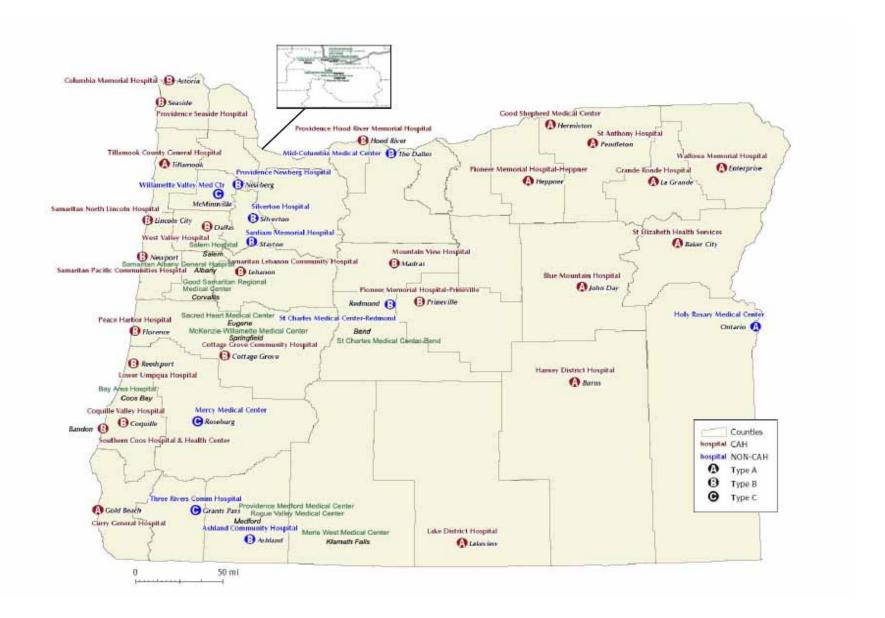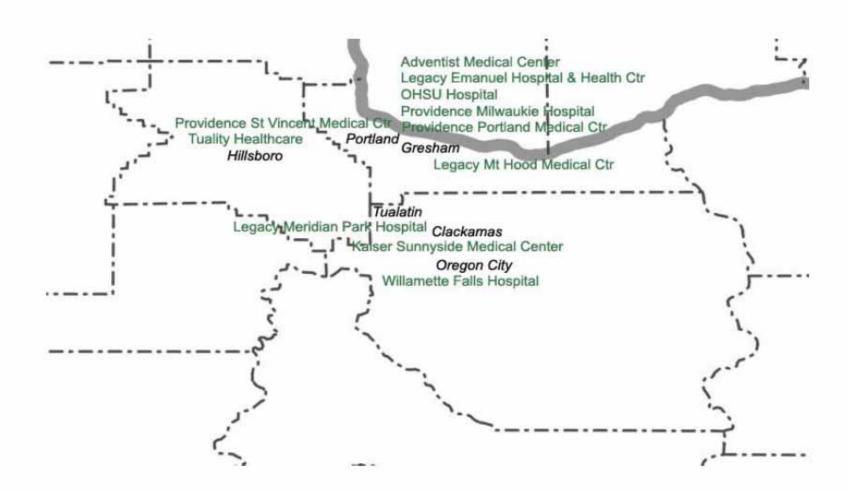Director, NERO Network
University of Oregon

D.   Maps
    1. Hospitals by HRSA region
    2. Hospitals by type of hospital
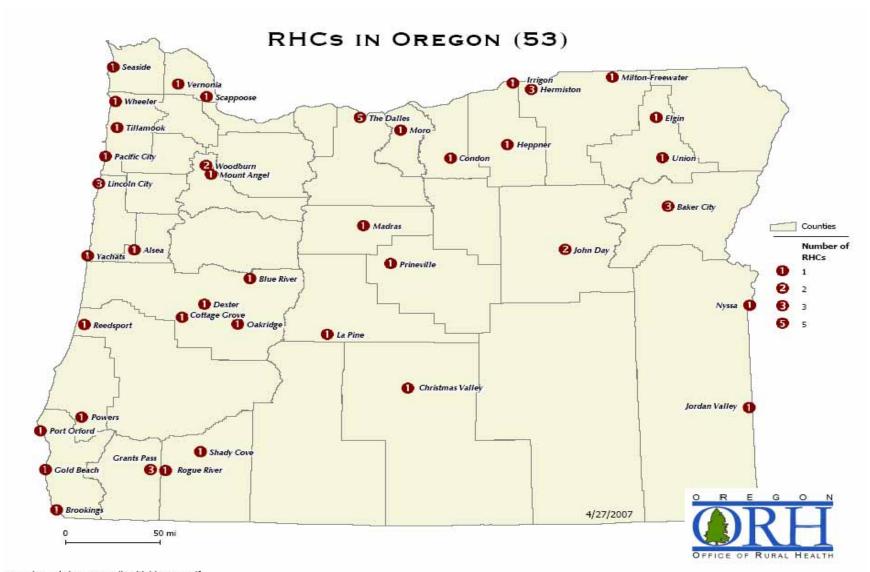   3. Rural Health Clinics

Hospitals by HRSA Regions

Hospitals by HRSA Regions

Hospitals by Type of Hospital

Columbia Memorial Hospital **B** *Astoria*

B *Seaside*
Providence Seaside Hospital

Providence Hood River Memorial Hospital

B *Hood River*

Tillamook County General Hospital
Mid-Columbia Medical Center **B** *The Dalles*

A *Tillamook*

Good Shepherd Medical Center

A *Hermiston*

St Anthony Hospital

A *Pendleton*

Providence Newberg Hospital
Willamette Valley Med Ctr **B** *Newberg*

Wallowa Memorial Hospital

Pioneer Memorial Hospital-Heppner
Grande Ronde Hospital **A** *Enterprise*

A *Heppner*

A *La Grande*

C
McMinnville

Silverton Hospital

Samaritan North Lincoln Hospital

B *Lincoln City*

B *Silverton*

B *Dallas*

West Valley Hospital
Santiam Memorial Hospital

Salem Hospital **B** *Stayton*

Salem

St Elizabeth Health Services

A *Baker City*

B *Newport*
Samaritan Albany General Hospital
Samaritan Pacific Communities Hospital **B** *Lebanon*

Albany

Samaritan Lebanon Community Hospital

Mountain View Hospital

B *Madras*

Blue Mountain Hospital

Good Samaritan Regional
Medical Center
Corvallis

Pioneer Memorial Hospital-Prineville

Redmond **B**
B *Prineville*

A *John Day*

Peace Harbor Hospital

Sacred Heart Medical Center
Eugene
St Charles Medical Center-Redmond

Holly Rosary Medical Center

Ontario **A**

B *Florence*

McKenzie-Willamette Medical Center
Springfield
Cottage Grove Community Hospital

St Charles Medical Center-Bend
Bend

B *Reedsport*
Lower Umpqua Hospital

B *Cottage Grove*

Bay Area Hospital
Coos Bay

Harney District Hospital

A *Burns*

Coquille Valley Hospital

Mercy Medical Center

Bandon **B**
B *Coquille*
C *Roseburg*

Southern Coos Hospital & Health Center

Three Rivers Comm Hospital
A *Gold Beach*
C *Grants Pass*
Providence Medford Medical Center
Rogue Valley Medical Center
Curry General Hospital
Medford
Ashland Community Hospital

Merie West Medical Center
Klamath Falls

Lake District Hospital

A *Lakeview*

B *Ashland*

Legend:
☐ Counties
hospital CAH
hospital NON-CAH
A Type A
B Type B
C Type C

0   50 mi

114

Adventist Medical Center
Legacy Emanuel Hospital & Health Ctr
OHSU Hospital
Providence Milwaukie Hospital
Providence St Vincent Medical Ctr   Providence Portland Medical Ctr
Tuality Healthcare   Portland
Hillsboro   Gresham
Legacy Mt Hood Medical Ctr

Tualatin
Legacy Meridian Park Hospital   Clackamas
Kaiser Sunnyside Medical Center
Oregon City
Willamette Falls Hospital

Oregon Rural Health Clinics (RHC's)

RHCs IN OREGON (53)

E.   OHN Infrastructure Committee – Request for Information

Attached.

FCC Application Infrastructure Committee

Issues the Following

Request for Information

For

Oregon Health Network

Date of Electronic Issuance: February 20, 2007   (http://www.ortelehealth.org/)

Proposals Due: March 19, 2007

Issued for the Oregon Health Network Technical Committee on behalf of the OHN Governance Group:

Respond by e-mail to:

edparker@teleport.com

or by mail to:

Parker Telecommunications
PO BOX 402
Gleneden Beach, OR 97388

ATTN: Dr. Edwin B. Parker (541.764.3058; edparker@teleport.com)

REQUEST FOR INFORMATION
FOR OREGON HEALTH NETWORK ACCESS AND NETWORK SERVICES

TABLE OF CONTENTS

REQUEST FOR INFORMATION
FOR OREGON HEALTH NETWORK ACCESS AND NETWORK SERVICES

VISION

The concept is to create a digital broadband network of networks that would securely and privately interconnect all Oregon hospitals and clinics, including dental and optical clinics, for the provision of telehealth services. In addition it would connect Oregon hospitals and clinics with all Oregon state and county public health offices and all Oregon educational institutions that provide training for health care professionals or para-professionals. The network would interconnect with both the Internet and Internet2 (or National Lambda Rail) to reach relevant sites on those networks. It would be inter-operable with Oregon public safety networks to coordinate disaster planning and response. It would also connect with health insurers for secure payment mechanisms and to Oregon pharmacies for secure electronic prescribing applications. It would be securely accessible via the Internet to permit authorized access from other locations, including for clinicians on call from their homes and for home health monitoring and communicating with patients in their homes. The network would permit reliable data, digital image, digital voice and digital video transmission with quality sufficient for real time clinical instruction and medical consultations. It would provide a network suitable for secure exchange of electronic medical records among those with appropriate authorization. It would save travel costs by permitting multi-site videoconferencing for administrative conferences, education and training courses for certification and continuing education, and clinical consultations.

BACKGROUND

The Federal Communications Commission (FCC) has announced a pilot program that will pay for up to 85 per cent of the costs of such a network for successful applicants. The pilot program is currently limited to two years of funding. Funds may be used for both network design and implementation. (The 15 percent that participating institutions would be required to pay, in many cases, may be less than they are now paying for network connectivity or may permit availability of expanded network capacity at costs comparable to present network costs.) Information about the proposed FCC pilot program is available at http://www.fcc.gov/cgb/rural/rhcp.html. The FCC's rural healthcare program of the Universal Service Fund (USF) could subsidize on-going annual costs for connecting rural locations. Information about this ongoing subsidy program is available at http://www.fcc.gov/wcb/tapd/ruralhealth/welcome.html. The Rural Utility Service (RUS) of the US Department of Agriculture has a telemedicine and distance learning grant program that could be used to pay for routers, videoconference equipment and other network equipment at end user sites. This is an independent and additional funding opportunity. The FCC application will not be made dependent on later getting RUS funding.

PURPOSE

The purposes of this Request for Information (RFI) are to:

- Identify interested Access, Internet, Network, and Other service providers
- Seek budgetary estimates, solution alternatives, and pricing proposals to provide ethernet connectivity to as many statewide hospitals, clinics, community colleges, health departments and other eligible end-user entities as possible

As the timeline application to the FCC may not permit more detailed and committed pricing, the budgetary estimates received will be used for the FCC application. Please note the minimum submission requirements specified below for responses to this RFI.

Further, since there may be more than one solution to these challenges, responses are welcome that could offer a different approach. Respondents may selectively address any part or parts of this RFI of interest to them without any requirement to address other parts of the RFI. In any event, it would be beneficial if the RFI responses would facilitate easy incorporation into the application to the FCC for funding. As such, please address:

- Proposed technology
- Reason that technology is proposed
- Number of communities and/or stakeholders addressed with your proposal
- What is the basic reference design
- What equipment would be deployed
- What type of network is proposed
- [If proposing a NOC solution] The location and features of any proposed NOC
- [If proposing NAP facilities] The location and features of proposed NAP(s)
- [If access facilities] How these facilities will access the Network
- Summary of budgetary estimates including both nonrecurring and recurring costs
- Optional: Spec Sheets for equipment/technology to be deployed
- Optional: Key Personnel Biographies and Credentials

NETWORK CONSIDERATIONS

A. Network Operations Center (NOC)

A governing organization controlled by OHN users and potential users could contract with an organization that can provide NOC functions independent of the carriers providing backbone and network access transport functions. It would have network monitoring capability to each of the Network Access Points (NAPs) and Network Interconnection Points (NIPs), and possibly end user locations.

The function of the NOC is to monitor end to end performance and to resolve issues that degrade performance below specified levels. Therefore, the NOC needs tools: we're

proposing one or more dedicated monitoring and telemetry devices at each site. One such tool might be an inexpensive embedded Linux or BSD device with open source tools (called a "leaf node".) These devices would not only need to be available to the NOC, but also to any other similar device in the OHN. The NOC will regularly poll the leaf node for a few base statistics (e.g. up/down, jitter/latency to specific site, and maybe two more) and populate this data into a web-based management system visible to everyone in OHN.

In addition, the NOC and NOC support staff at participating organizations would have access to the dynamic real-time (perhaps disruptive) test suite such that any two "leaf nodes" could set up a point-to-point throughput/jitter/latency test. Several default tests can be preloaded with varying degrees of invasiveness. Access can be streamlined by preloading code in a protected web page, and NOC staff should be able to divide the sections of the network quickly to rapidly determine the zone where the issue may be. Note that larger organizations may need multiple (maybe larger) leaf nodes to adequately support their participants.

The NOC would need to select one or more devices to buy in bulk. Come up with an image and operational plan for deployment. It would need to provide the back end systems (open source network management suites, SSL web, etc.) and staff the activity going forward. Note that the NOC needs to be able to serve NOCs at participating organizations, and end user customers at small clinics.

Alternative solutions are encouraged, however, the ability to generate historical as well as arbitrary point-to-point statistics for jitter/latency/throughput is a requirement. Keeping the cost down is also a requirement as these leaf nodes need to be inexpensive enough to ubiquitously deploy. And lastly, sharing the information across OHN, both with customers and partnering sites is also a requirement.

B. Network Access and Interconnection Points

The network could begin with as few as four Network Access Points plus additional Network Interconnection Points (NIPs) at appropriate locations to interconnect with Stakeholders' regional networks. There should be at least one NAP or NIP in each of the seven Health Resources and Services Administration (HRSA) regions in Oregon. Additional NIPs could be made available by the network service providers. Each NAP would have network interconnection/exchange facilities and provide the opportunity for the collocation of network equipment for multiple carriers to interconnect. Local traffic within the region(s) served by each NAP would be handed off locally at that location, with traffic for other locations handed off to a network backbone provider. Another potential use of a NAP could be for interconnection to OHN users' regional and/or partner networks. Possible locations for regional aggregation facilities include: Portland metropolitan region (NWAX?), Eugene/Springfield (OIX?) Medford/Ashland, and Bend/Redmond. These NAPs should also serve as network exchange locations for other network traffic in addition to OHN traffic because costs for all will be lower in such multipurpose facilities and because it will facilitate reliable connections to local off-net

points for patient home health monitoring, patient education and other health care applications. Provider specified NIPs will be desirable to reduce the access and transport costs for service to more remote locations. Potential providers of NAP or NIP facilities are requested to provide information about their proposed locations and budgetary nonrecurring and recurring charges.

C. Backbone Network(s)

The NAPs should be connected by one or more backbone network providers meeting at least the following criteria:

   a. Provide self-healing ring architecture connecting all four initial NAPs .
   b. Provide Ethernet interfaces at all NAP locations and provider-specified NIP locations
   c. Exchange traffic at all NAP locations by peering with OHN ISPs and deliver traffic between NAPs. The connection between NAPs should be a routed (layer 3) connection using the providers ring with no more than two router hops between participating networks.
   d. Meet network QoS performance specs with respect to jitter, transit delay and dropped packet standards.
   e. Provide a standard price list for backbone port access and network transit for all OHN eligible entities in increments including 10 Mb, 100 Mb and 1Gb.
   f. Provide a list of additional locations (NIPs), if any, at which interconnection to OHN can be made, with prices specified if different from those at the primary NAP locations.
   g. Permit monitoring of OHN traffic through the NAP locations by the NOC for measurement of QoS and gathering of network traffic statistics.

OHN will permit all backbone network carriers meeting the above criteria to connect and provide services to, from and among NAP locations. The network backbone providers must agree to interconnect with each other at two or more of the NAP locations, per interface standards specified above. If two or more backbone providers offer OHN services, they will be expected to compete on the basis of price, service quality and the ability to provide access from network member end user locations to the NAP locations. OHN will not require the backbone providers to provide dedicated physical network facilities and will accept services via shared facilities.

D. Local Service Provider (LSP)

Local Service Providers (LSP) provide layer 1 and 2 transport services to connect OHN members to the network. LSPs may also functions as Internet Service Providers (ISP) as described below but in the event a customer desires to use another ISP other than the LSP, the LSP will deliver the customer's traffic to the customer's selected ISP at the closest NAP via layer 2 Ethernet Virtual Local Area Network. LSP connections to OHN regional aggregation locations from hospitals, clinics, community colleges, health

departments and other eligible end-user entities will be obtained through competitive procurements, with the expectation that different incumbent local exchange carriers (ILECs), competitive local exchange carriers (CLECs), cable companies or other providers will be the lowest cost provider in different locations. The connections may be directly to a NAP location or through connection to an OHN backbone provider at a backbone provider specified NIP location. A backbone network provider may also be an access provider. Access bidders must quote both one time costs (installation or construction costs, for example) and recurring monthly or annual fees. In any case, the facilities will remain the property of the access network provider and may be used to provide services to other customers, provided the type and quality of services purchased by OHN users continue to be available to them. The OHN governing body may issue a general RFP as agent for a number of users, and may help users obtain FCC subsidy funds for payment of network charges, but the end user members of OHN will each be responsible for payment of both non-recurring and recurring charges of winning bidders for services to them. Pre-existing health networks, including the Southern Oregon Medical Network (SOMN) and existing hospital system networks may arrange a point or points of connection for traffic addressed outside their networks. LSPs must maintain a 24 hour NOC with the ability to answer customer calls within 15 minutes 99.5% of the time. LSPs may, where appropriate hand off customer issues to ISPs as agreed by the respective NOCs. LSPs will also keep the OHN NOC apprised of any issues that affect OHN performance.

E. Internet Service Providers (ISP)

OHN Internet Service Providers (ISP) will provide layer 3 interconnection and transit services. LSPs may also be ISPs however customers will be allowed to choose among ISPs offering service at the nearest NAP. ISPs must peer all OHN customer traffic with all other OHN ISPs at the NAPs as a condition for participation. ISPs may provide transit connections to the commercial Internet, and other locations as a commercial service in addition OHN interconnection. ISPs may be required to deliver OHN traffic to an Internet2 or National Lambda Rail service provider in a manner to be determined.

F. Network Protocols

The recommended Network would be defined by the following:
- Local connection may use any standard layer 1 and 2 service protocol as long as performance specifications and interconnection requirements at the NAPs and NIPs are met.
- Layer 3 connections will use Internet Protocol (IP) version 4
- Interconnection between Internet networks will use Border Gateway Protocol version 4

G. Interconnection with Other Networks

At some of the NAP locations network connections may be made with other networks, whether or not they are OHN backbone providers. Such networks may include Internet

Service Providers (ISPs) of whatever tier, Internet2, National Lambda Rail, DAS, NERO, OWIN, pharmacy networks and others that may be specified later. Please comment on how best to make these connections in the context of any NOC, NAP, transport or access proposals.

H. Security

Security will be achieved by
- Multiple VLANs depending on the virtual endpoints
- Potentially firewalled and encrypted if necessary
- VPN if accessed by IP

I. Performance

Service Type	Service Metrics				
Access	Availability	Latency	Jitter	Packet Delivery	MTTR
Ethernet	99.95%	7 ms	< 7ms	99.95%	4Hours

Service Type	Service Metrics				
* Network	Availability	Latency	Jitter	Packet Delivery	MTTR
Ethernet	99.95%	20 ms	< 20ms	99.95%	4Hours

* Worst case between any two Network Access Points

J. Service Locations

The intent is to create a network that can connect all Oregon hospitals, clinics, public health departments and healthcare education institutions. Four site lists are attached: Oregon hospitals, Oregon community colleges, Oregon county public health departments, and a partial list of Oregon clinics. Responders to this RFI should provide budgetary estimates (both nonrecurring and recurring) for connecting any of the listed locations that they can serve plus any additional clinic or healthcare related sites in the region they serve that could be considered as additions to the partial list.

A listing of locations can be found on line at http://www.ortelehealth.org/

Links to Organizations and Locations

County Health Departments and Locations
http://www.oregon.gov/DHS/ph/lhd/lhd.shtml

Hospitals
http://www.theagapecenter.com/Hospitals/Oregon.htm

Community Colleges
http://www.oregon.gov/CCWD/ccdirectory.shtml

Rural Health Clinics
http://www.ohsu.edu/oregonruralhealth/rhcs.html

PROPOSAL GUIDELINES

Comprehensive responses are desired that contain company information, solution proposals that identify non-recurring and recurring costs associated with the solution alternatives presented. Any assumptions made for the location of network access points or non-existing infrastructure must be stated.

All RFI submittals must be as follows:

1. One (1) digital copy in Microsoft Word or Adobe PDF format on CD/DVD or via email to edparker@teleport.com

2. Include a cover letter providing a designated point of contact: name, telephone, and email address.

3. All submittals must be **received** by 5 p.m. PST on March 19, 2007.

4. Any confidential information provided in the submittal must be clearly marked as confidential.

5. Address submittal packets (if CD/DVD) to:

Dr. Edwin B. Parker
Parker Telecommunications
PO BOX 402
Gleneden Beach, OR 97388

6. Questions about this RFI may be submitted by e-mail to edparker@teleport.com. We will attempt to answer questions at an OHN technical committee meeting in early March, currently scheduled for March 2.

The preparation and submission of your RFI is made at your expense and without obligation by Oregon Health Network Governance Group to acquire any of the items included in the RFI. Information is requested from all interested parties whether or not they have any intention to respond to a later Request for Proposals, should the requested funding be obtained. Information marked as confidential may be used in aggregate or generalized form to prepare the budget or other FCC proposal materials, without identifying the specific confidential information.

MINIMUM SUBMISSION REQUIREMENTS

To be considered as an Interested Service Provider for this or subsequent phases of the Oregon Health Network, a minimum submission containing the following information is requested:

1. Identify if your firm is an interested Access Provider, Network Provider, Other Service Provider, or any combination of these.
2. Identify the location(s) for which these services could be provided

DEFINITIONS

BSD – Berkeley Software Distribution (**BSD**, sometimes called **Berkeley Unix**) is the Unix derivative distributed by the University of California, Berkeley, starting in the 1970s. The name is also used collectively for the modern descendants of these distributions.

DAS – Oregon Department of Administrative Services

CLEC – Competitive Local Exchange Carrier

Edge – The furthest physical or logical extension of the Network, generally at a NAP or a NIP

FCC – Federal Communications Commission

HRSA – Health Resource and Service Administration, in this context, generally referring to regions as defined by HRSA

ILEC – Incumbent Local Exchange Carrier

IP – Internet Protocol, a network layer (Layer 3) protocol

ISP – Internet Service Provider

Jitter - an abrupt and unwanted variation of one or more signal characteristics, such as the interval between successive pulses, the amplitude of successive cycles, or the frequency or phase of successive cycles. Jitter is a significant factor in the design of almost all communications links. In packet networks the primary jitter problem is variation in the interval between arrival of different packets.

Layer(s) – Those generally accepted Layers as defined by the Open Systems Interconnection (OSI) model (http://en.wikipedia.org/wiki/OSI_model)

Local Access Facility/Loop – A 'single threaded' or Loop local network facility connecting Stakeholder(s) premise to a Network Access Spur, Network Access Loop, or other network

LSP – Local Service Provider

MPLS – Multi-Protocol Label Switching, a popular example of a packet switched network

NAP – Network Access Point, a physical location at which the Network may be accessed by Stakeholders

Network Access Loop – A network loop connecting Stakeholder(s) Local Access Facilities to more than one NAP

NERO –Network for Education and Research in Oregon

Network Access Spur – A 'single threaded' network facility connecting Stakeholder(s) Local Access Facilities to just one NAP

NIP – Network Interconnection Point, a physical location at which the Network may be interconnected by another Stakeholders' or participating entity's network

NOC – Network Operations Center, an entity that has responsibility for the operations of the Network

OHN (or: The Network) – The Oregon Health Network, the network that facilitates the interconnection of the participating entities

OWIN – Oregon Wireless Interoperability Network, a planned Oregon public safety network

PDF – Portable Document Format

QoS – Quality of Service

SOMN – Southern Oregon Medical Network

Stakeholder(s) – An individual, organization, or a telecommunications network of same that participate, or desire to participate, in realizing the benefits derived from the Network

USF –Universal Service Fund, administered by the FCC

VPN – Virtual Private Network, a secure internetworking 'tunnel' through an otherwise public network

VLAN – Virtual Local Area Network, a means of creating multiple or independent logical connections within a physical network

F.   Oregon Health Network Waiver Requests to the FCC

The Oregon Health Network (OHN) requests a waiver to allow all of Oregon's FQHCs, whether classified as rural or non-rural sites, to be qualified for Universal Service Fund (USF) subsidy. These sites are considered to be a critical component of the OHN because they represent the primary medical home of Oregon's poorest, uninsured and underserved residents. Given the President's expressed intent to bring all FQHCs centrally into the initiative for the portability and exchange of patient Electronic Health Records, these centers are essential in the OHN, and their ongoing ability to participate is contingent upon their eligibility for federal subsidy.

OHN requests that the FCC waive the mileage-based transport cost assumptions in current rural health USF rules to remove that requirement for locations where pricing is not based on mileage. Within the Portland metropolitan area, broadband Ethernet rates in the current medical network are not based on mileage. Similarly, most of the responses to the OHN RFI provided prices that are not based on mileage, but are significantly higher in rural locations than in urban locations. OHN requests that the on-going subsidy mechanism reflects this current broadband pricing reality and subsidize the difference between urban and rural rates for comparable services at otherwise eligible facilities in otherwise eligible rural locations.

OHN requests a waiver from the current rural health USF rules to eliminate the "disconnect/reconnect" requirement. OHN agrees that getting competitive bids is essential to getting the lowest price and understands the need to disconnect and reconnect when changing providers. However, when a telecommunications provider currently serving that location provides the winning bid, we request waiving the disconnect/reconnect requirement when the winning bidder currently serves the facility to minimize service disruptions to medical facilities.

OHN requests a waiver of any other rural health USF rules that would otherwise make it difficult to implement the OHN network proposal.